Azure OpenAI Security: Best Practice on using Azure OpenAI service

Beata Zalewa

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About me

Security Architect

Consultant

Microsoft Certified Trainer

AI & Cybersecurity Practitioner

Developer

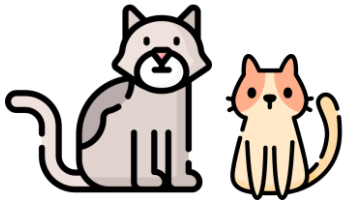
Freelancer

Azure @ ❤

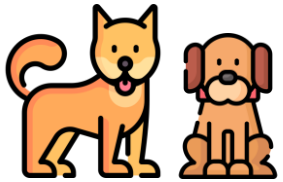
Google Cloud

1 Husband

1 Daughter



2 cats



2 dogs

Detective stories

Photography

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Introduction to GenAI Applications

- GenAI applications are those that use large language models (LLMs) to generate natural language texts or perform natural language understanding tasks.
- LLMs are powerful tools that can enable various scenarios such as content creation, summarization, translation, question answering, and conversational agents.

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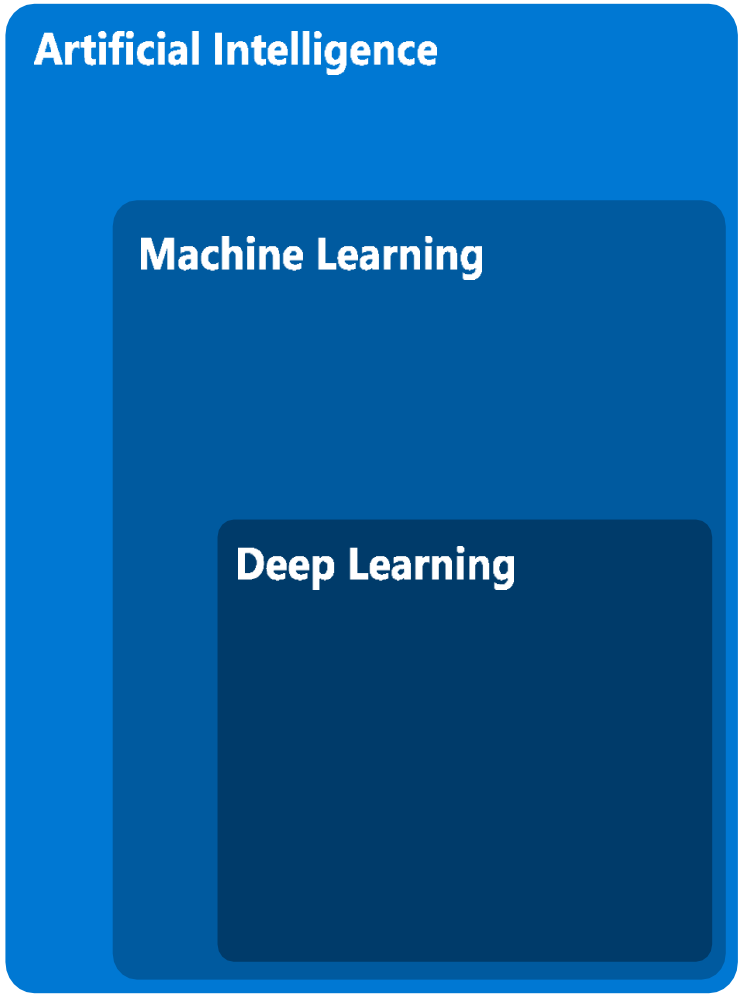
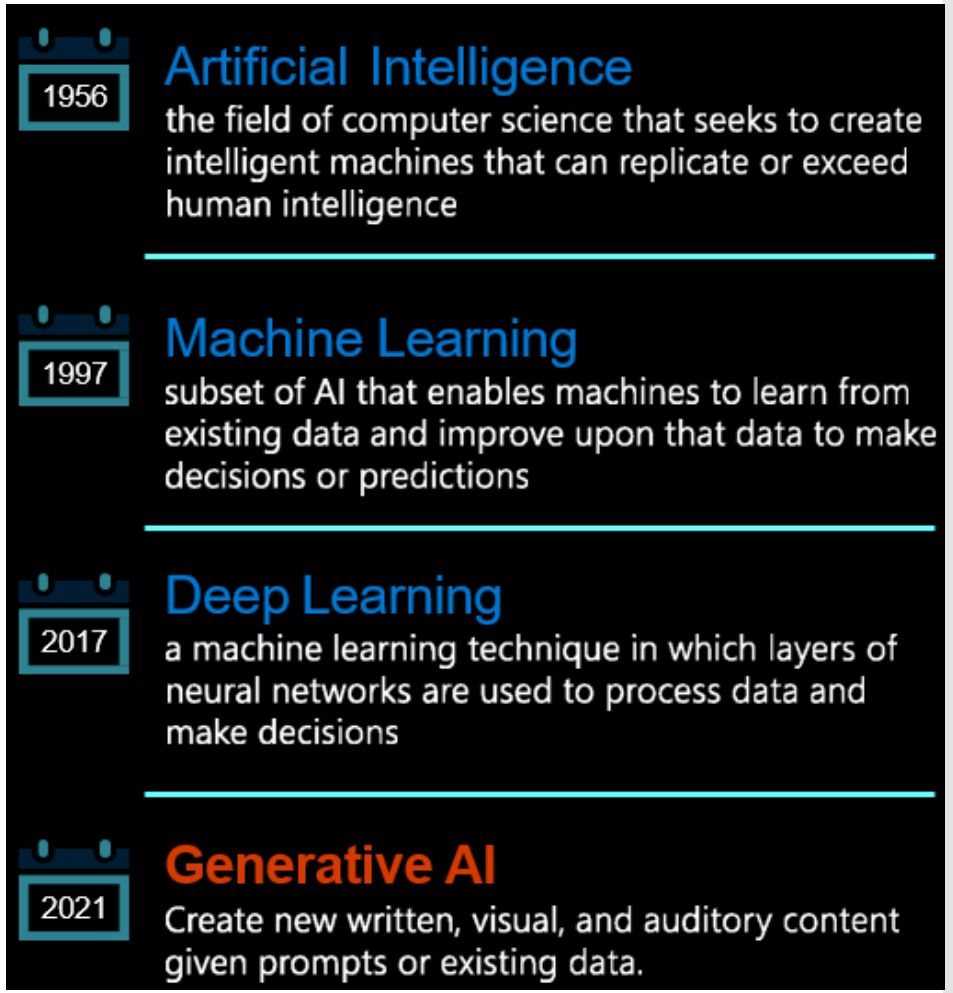
Introduction to Azure OpenAI





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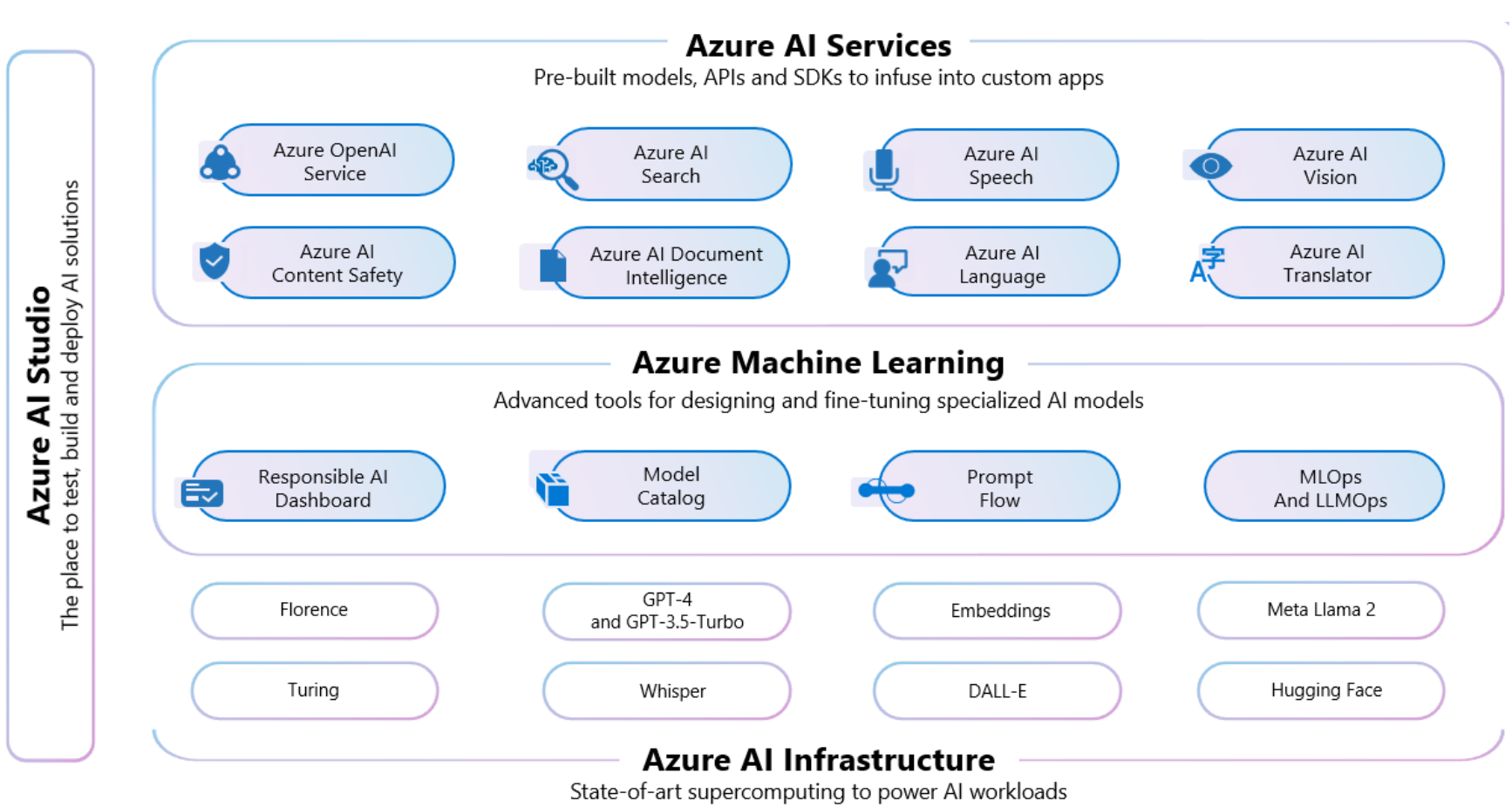
The Microsoft Azure AI Portfolio



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Security Challenges in GenAI Applications

- **Data Protection**: Confidentiality and integrity of training and query data.
- **Service Reliability**: Ensuring availability and reliability of LLM services.
- **Misuse Prevention**: Preventing misuse or abuse by malicious actors or unintended users.
- **Output Monitoring**: Auditing outputs for quality, accuracy, and compliance.
- **Ethical Management**: Managing ethical and social implications of outputs.

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Jailbreak Attack or User Prompt Injection Attack (UPIA)

Intentional attempt by a user to

Exploit the vulnerabilities of an llm-powered system

Bypass its safety mechanisms

Provoke restricted behaviors.

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Jailbreak risk detection or Prompt Shields for User Prompts

Unified API that analyzes LLM inputs and detects **user prompt and document** attacks

Model that identifies anomalies in user prompts as potential jailbreak attacks

Enhances the security of LLM deployments

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The principle of shared responsibility

- **The principle of shared responsibility** highlights that security in the cloud is a two-way street.
- While Microsoft ensures the security of the Azure OpenAI services, it is the customer's responsibility to secure their end of the interaction.

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Microsoft responsibility

Protecting the Azure infrastructure

Making sure that the Azure OpenAI services are secure by default

Providing identity and access management capabilities

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Customers responsibility

Setting appropriate access controls and permissions for their use of Azure OpenAI

Protecting their Azure credentials and managing access to their Azure subscription

Ensuring that the security measures around their applications are adequate, including input validation, secure application logic, and proper handling of Azure OpenAI outputs

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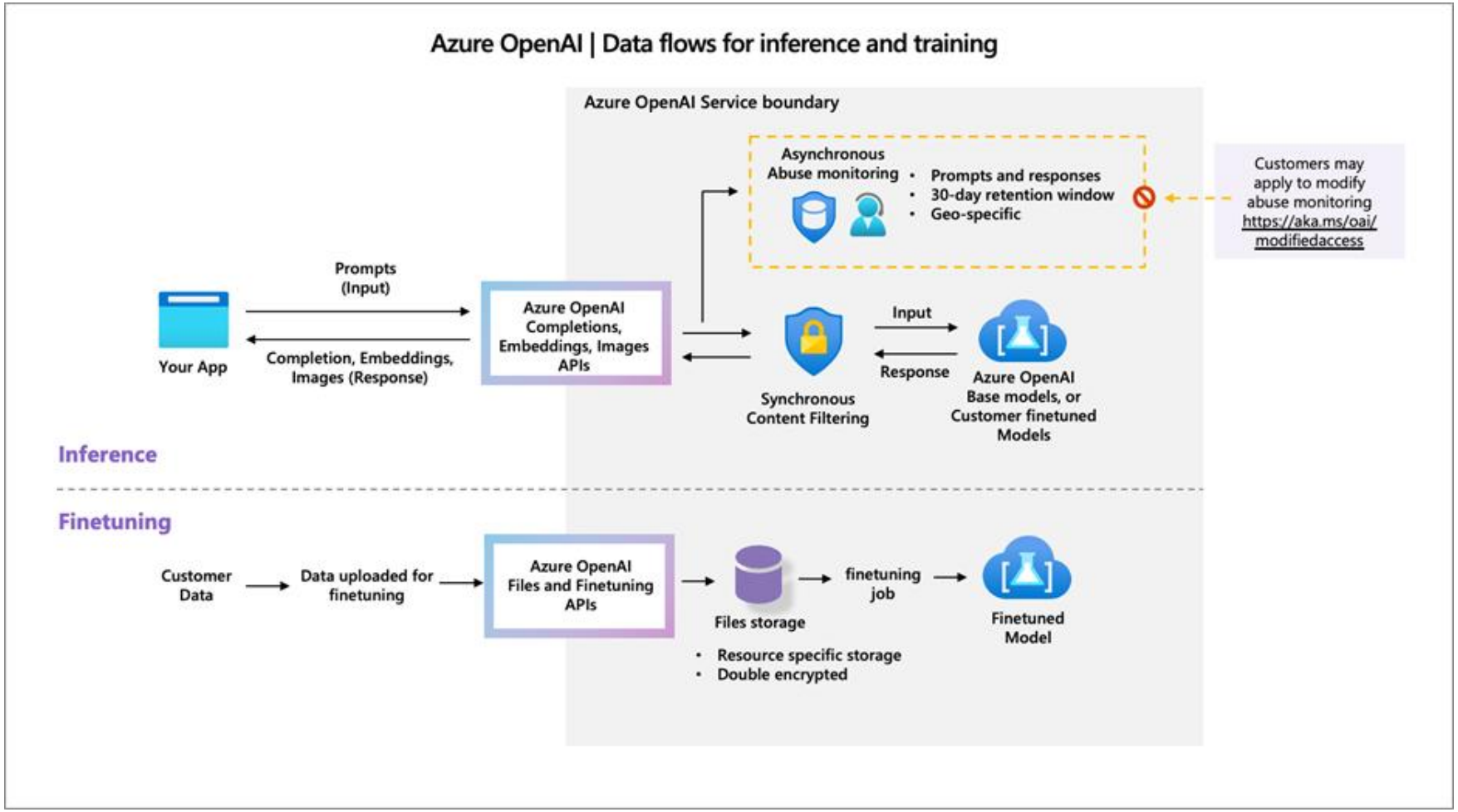
How does the Azure OpenAI Service process data?



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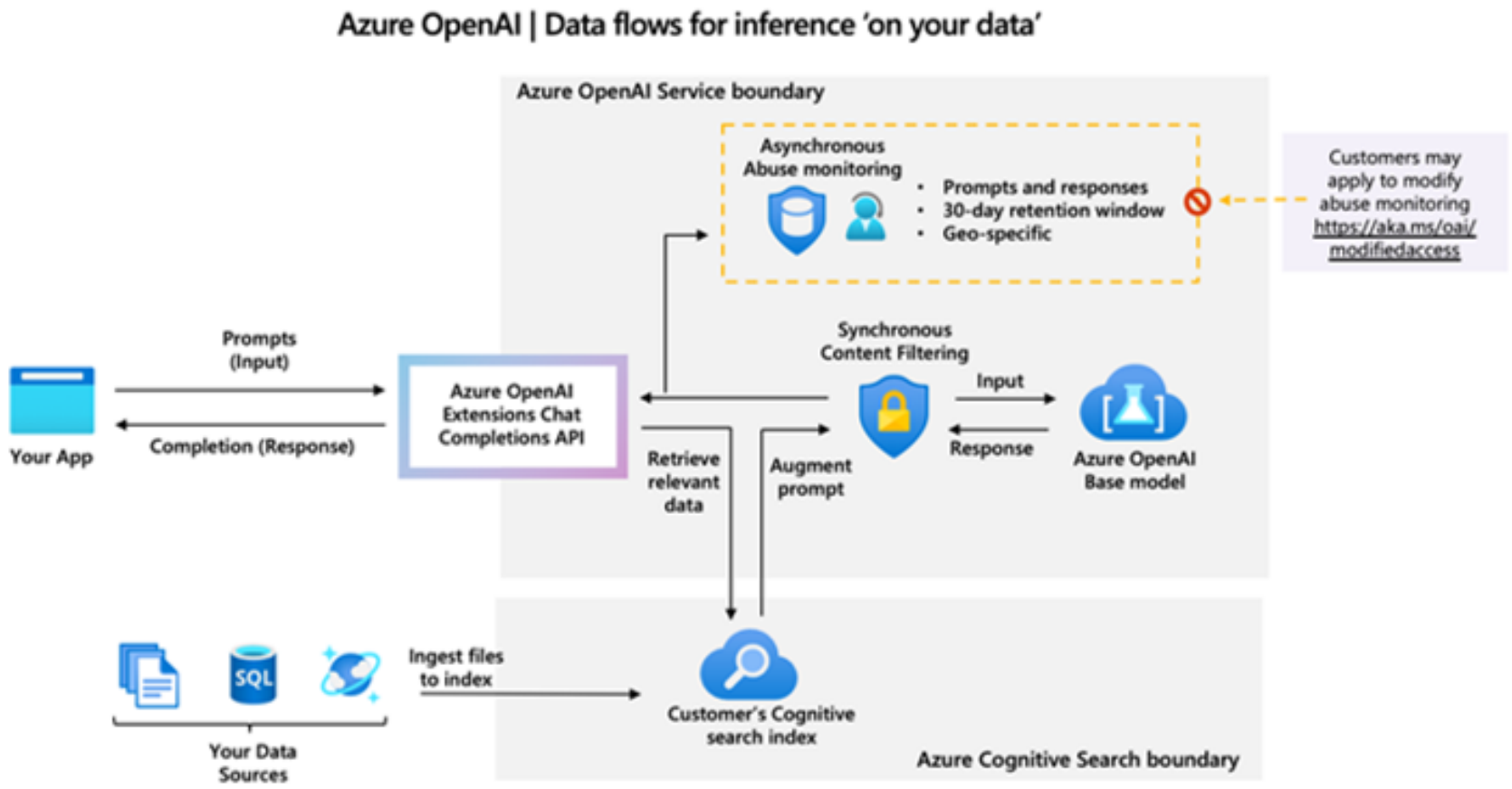
Augmenting prompts with data retrieved from your data sources to "ground" the generated results



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Data Processing Foundations

Core principles of data processing:

- Secure data processing
- Efficient algorithms
- Real-time processing
- Compliance with standards
- Scalability

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Core principles of data storage

- Azure OpenAI’s approach to data storage and processing is built on strong, secure foundations.
- User data is guarded against unauthorized access, ensuring privacy and security in line with Microsoft's data protection standards.

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Core principles of data storage

- Regarding the types of processed data, Azure OpenAI processes your input - prompts and the ensuing AI-generated answers.
- It also processes data submitted for the purpose of training tailored AI models.

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Privacy

- **Privacy** in Azure OpenAI refers to how user data is handled in terms of access and usage.
- It ensures that data such as inputs, interactions, and outputs are used in a way that respects customer confidentiality.
- Azure OpenAI's privacy protocol dictates that Microsoft does not view or use this data for its own purposes, unless explicitly permitted for services like model fine-tuning.

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Privacy Protection

Ensuring user privacy:

- Data anonymization
- User consent
- Data minimization
- Privacy policies
- Compliance with GDPR

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Data privacy

- As for the usage of data, the **principles are simple**.
- The input you provide, along with the AI responses - your data - **remains yours.**
- Microsoft does not use this data to better their own AI offerings. It is kept private unless you choose to use it to train customized AI models.

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Data privacy

- The service's content generation capacity comes with a commitment to safety.
- Input is carefully processed to produce responses, and content filters are in place to prevent the generation of problematic content.

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Data privacy

- Customizing models is a service feature that's handled with care.
- You can train Azure OpenAI models with your data, knowing that it remains secure and for your use only.
- Privacy measures are about control over and the ethical handling of data.

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Data privacy

- To prevent abuse, Azure OpenAI comes equipped with robust content filtering and monitoring systems.
- This is to make sure that the generation of content complies with guidelines and that nothing harmful slips through.

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Privacy Policies

Privacy policies in place:

- Policy overview
- User rights
- Data usage
- Data sharing
- Policy updates

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Compliance Standards

Compliance with industry standards:

- ISO certifications
- GDPR compliance
- HIPAA compliance
- SOC 2 compliance
- Regular compliance audits

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Azure OpenAI Studio

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Security

- **Security**, on the other hand, is about protecting data from unauthorized access, breaches, and other forms of compromise.
- Azure OpenAI employs a range of security measures, such as encryption in transit and at rest, to safeguard data against threats.
- Microsoft's infrastructure provides a secure environment designed to shield your data from security risks.

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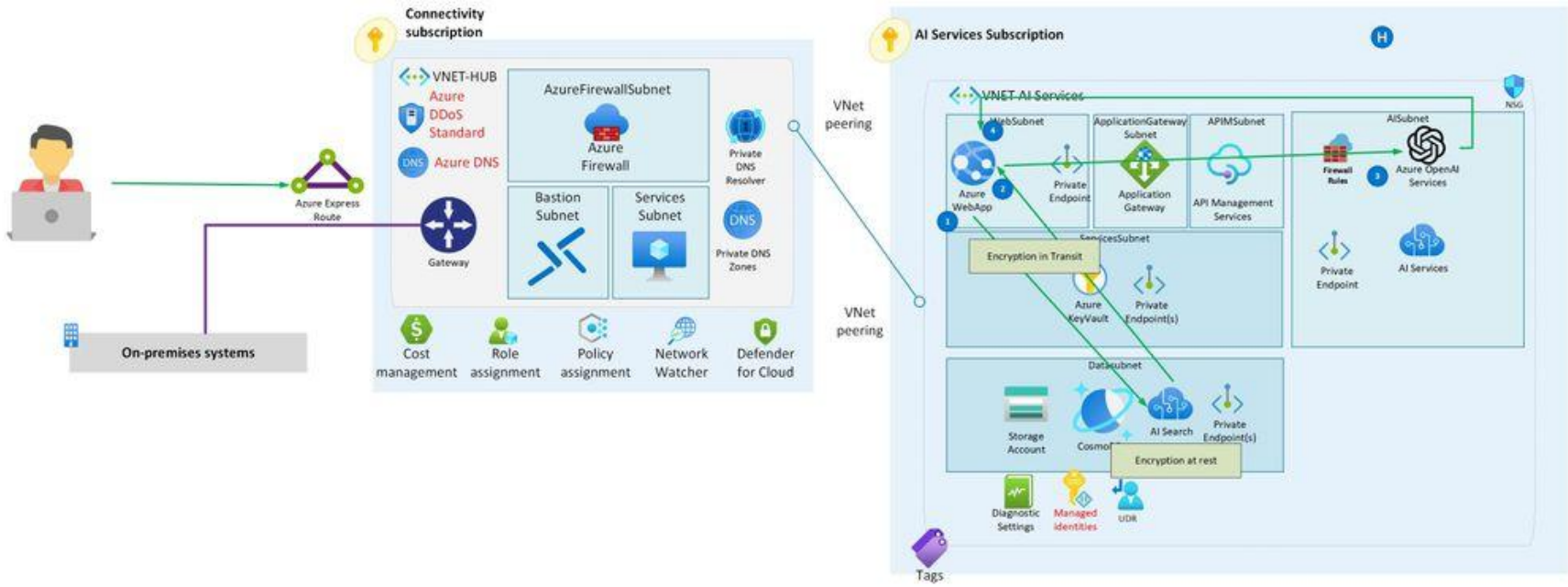
Data security



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Security Measures

Security measures in place:

- Encryption techniques
- Access controls
- Monitoring and logging
- Incident response regular audits

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Access Controls

Managing access to data:

- Role-based access control (RBAC)
- Multi-factor authentication (MFA)
- Least privilege principle
- Access reviews
- User activity monitoring

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Monitoring and Logging

Monitoring and logging practices:

- Continuous monitoring
- Log management
- Threat detection
- Incident response
- Compliance reporting

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Incident Response

Handling security incidents:

- Incident response plan
- Detection and analysis
- Containment and eradication
- Recovery and lessons learned
- Communication protocols

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Data Encryption

Encryption methods used:

- Encryption at rest
- Encryption in transit
- Key management
- Advanced encryption standards
- Data Classification and Sensitivity

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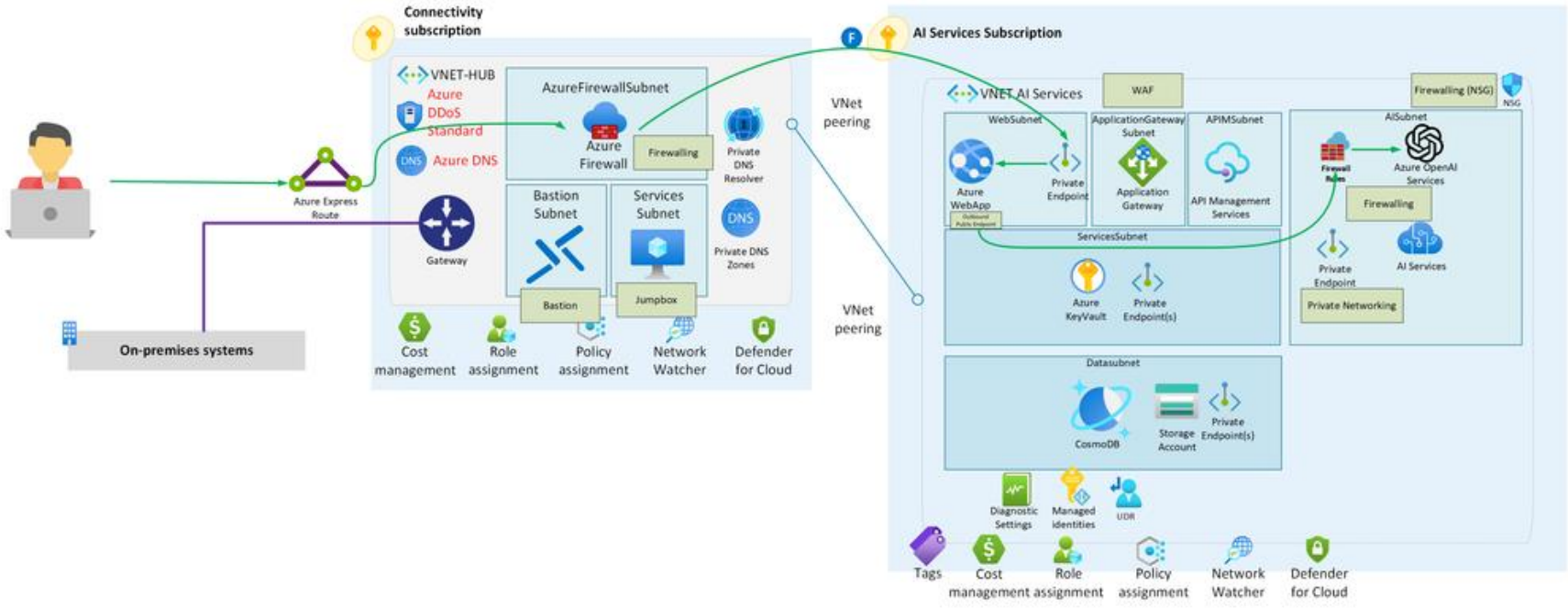
Network security



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Azure portal

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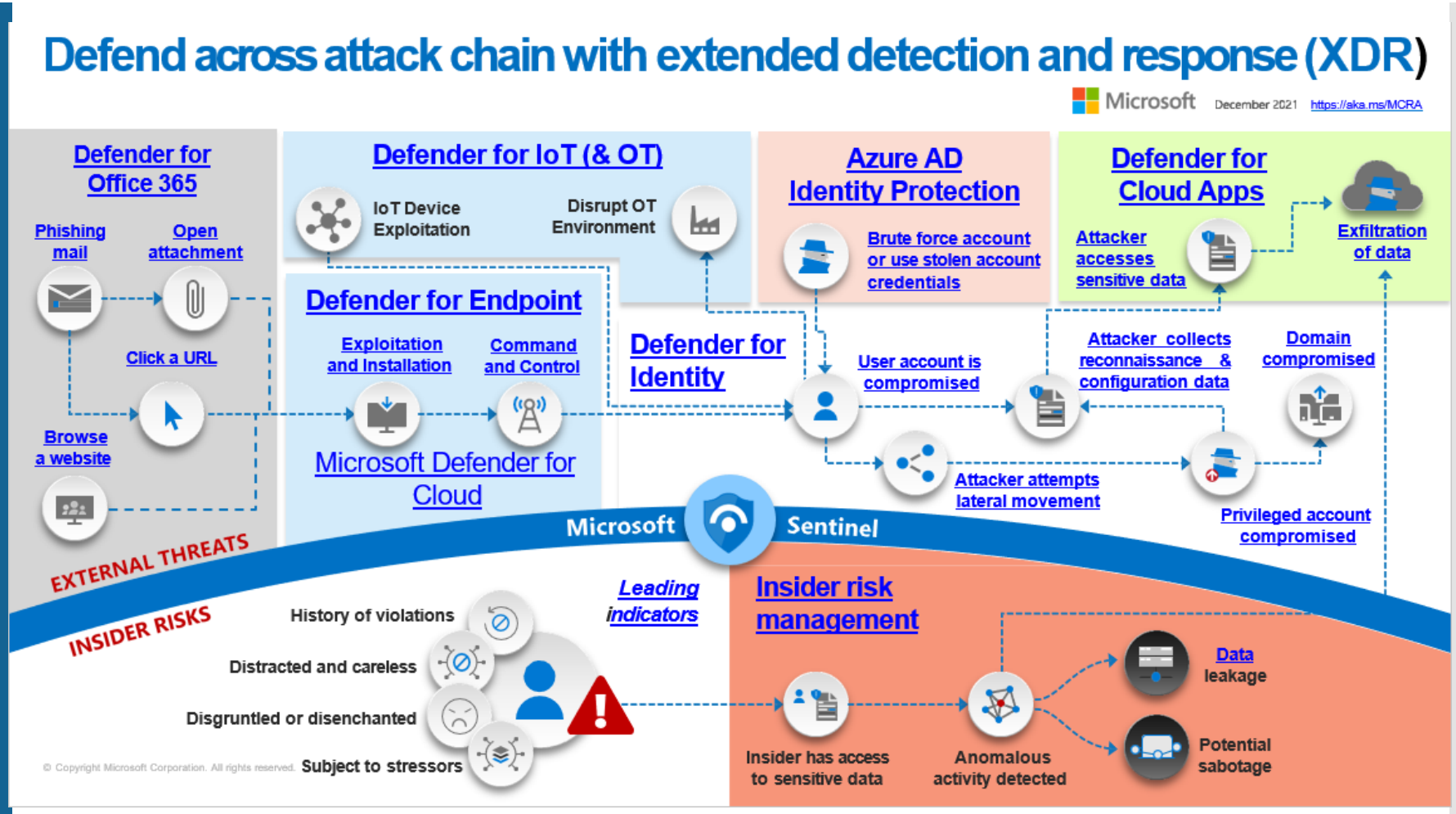
Defenders



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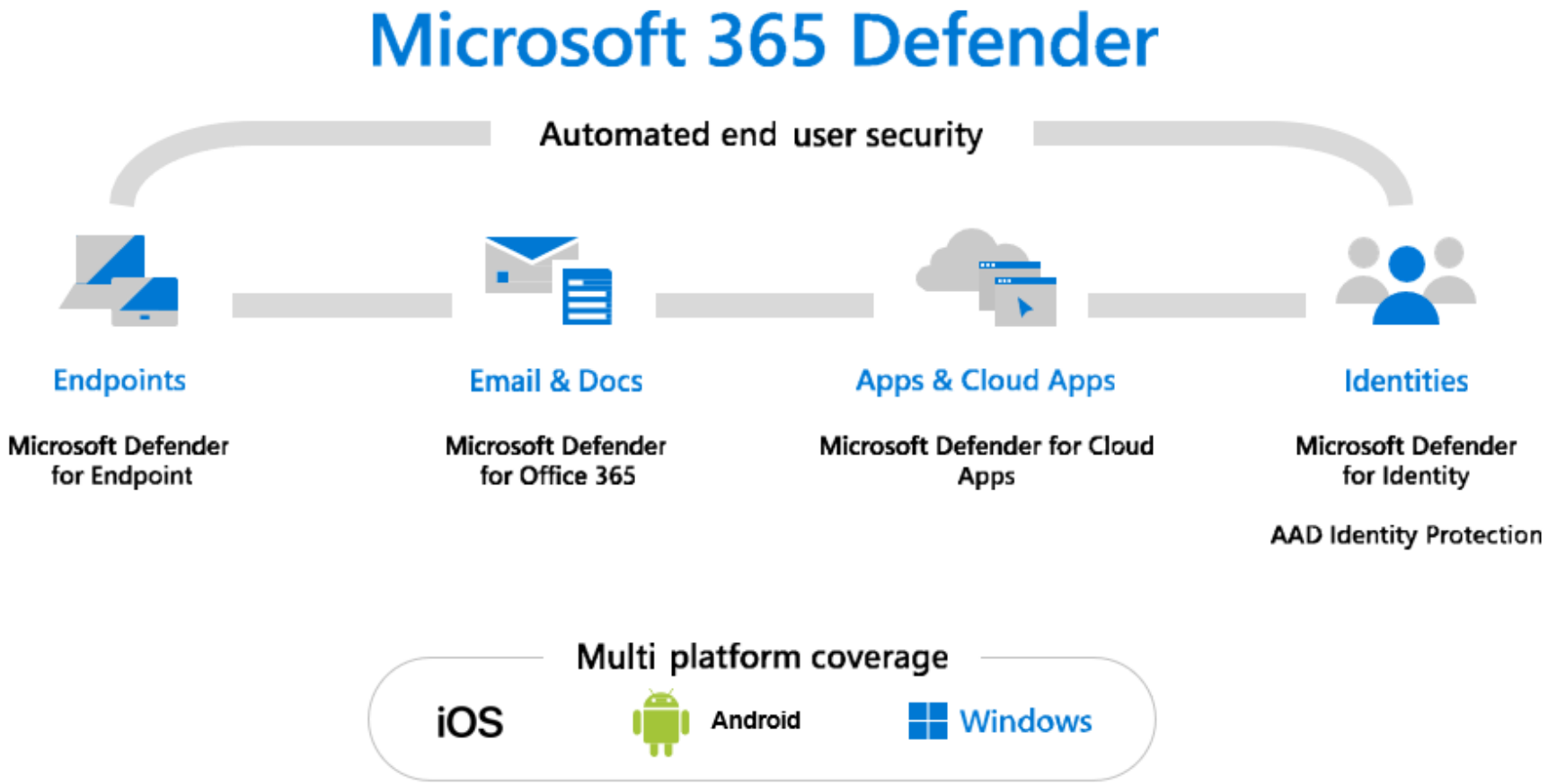
Microsoft 365 Defender



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Defender for Endpoint

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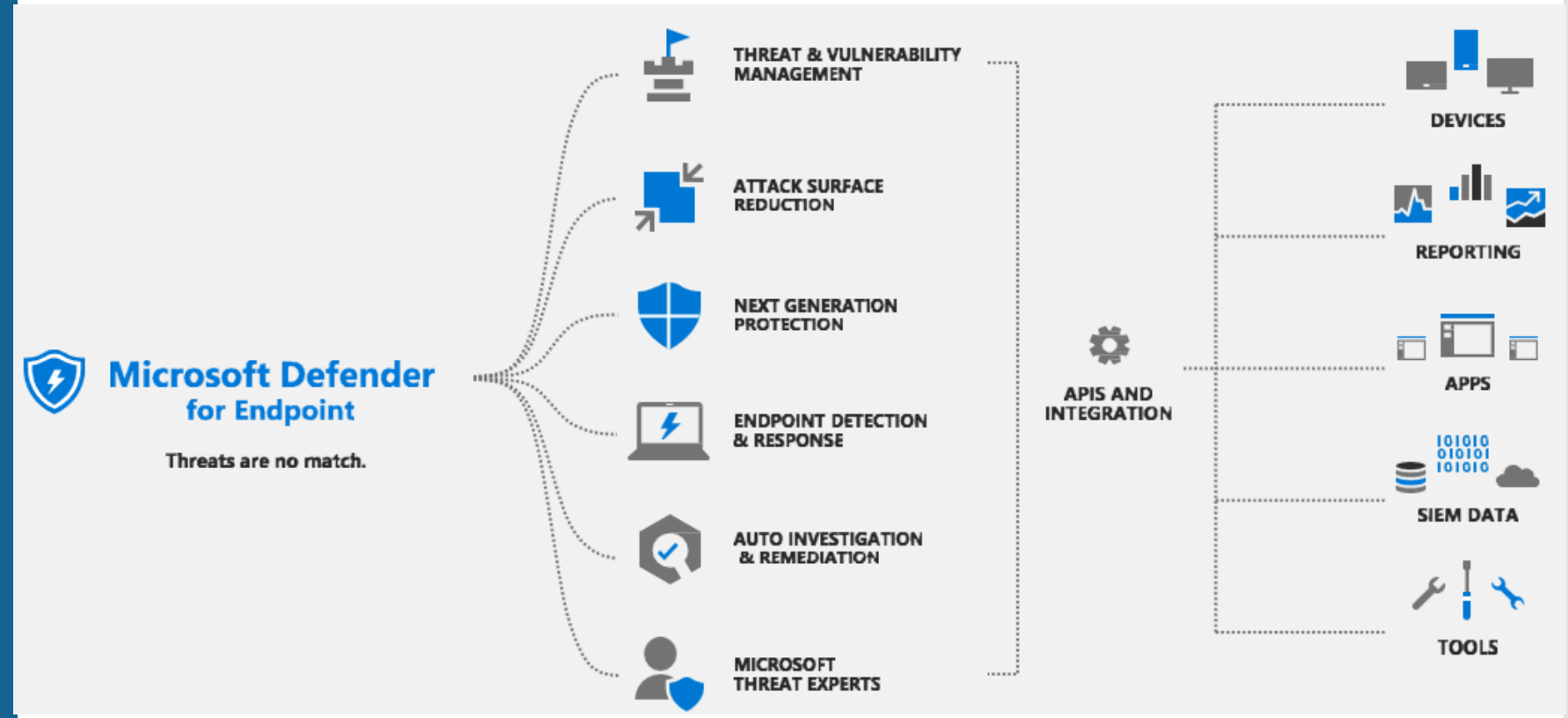
Connecting with the platform



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Defender for Endpoint

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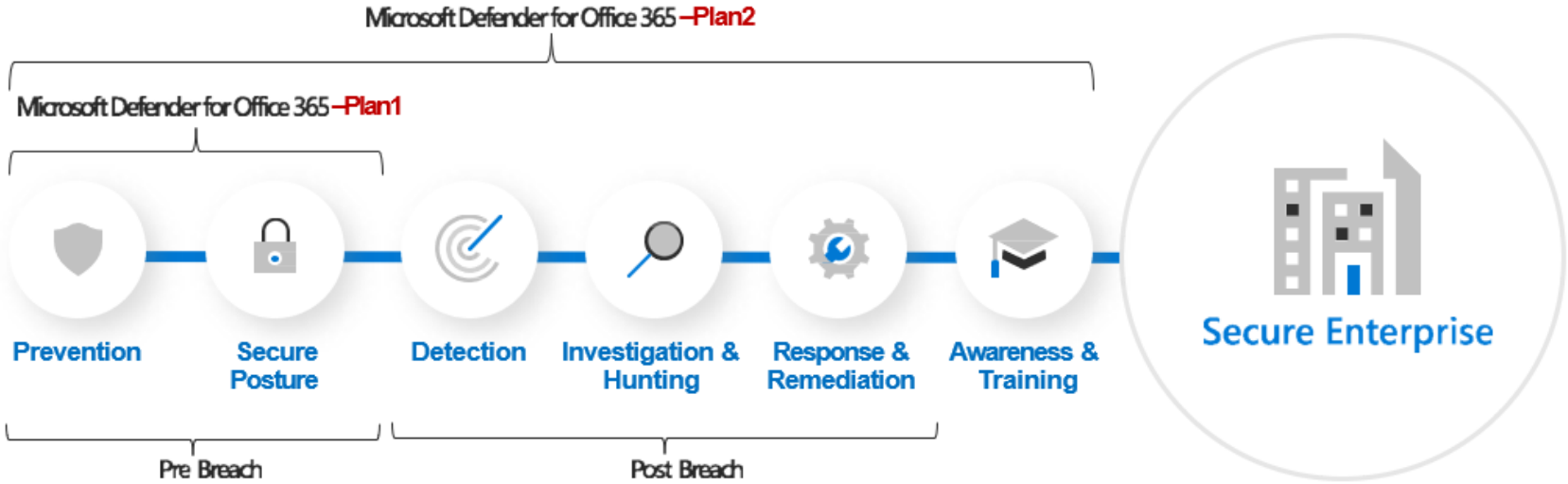
Defender for Office 365

Microsoft Defender for Office 365

Securing your enterprise requires more than just prevention



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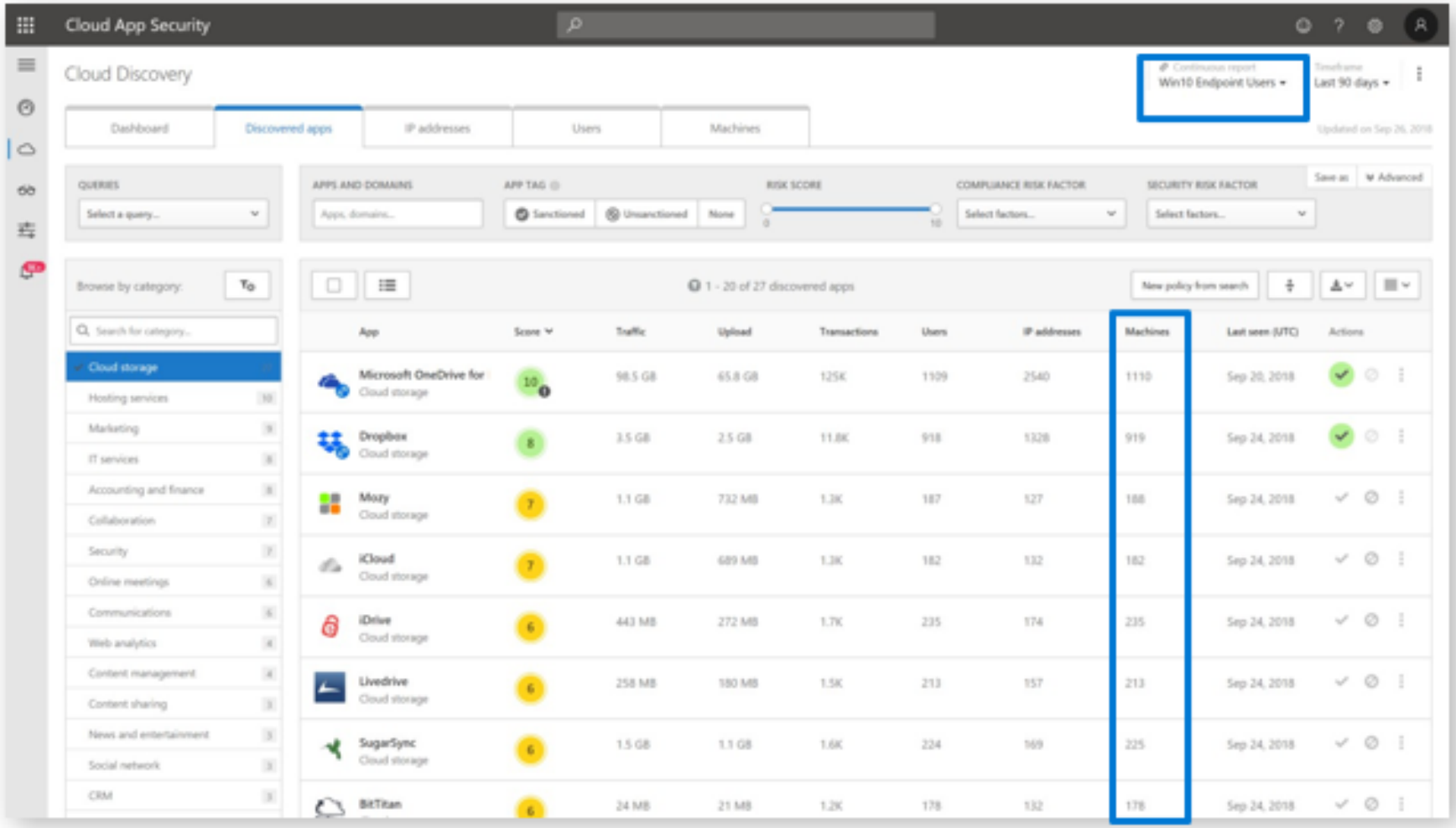
Defender for Cloud Apps



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Used resources

https://learn.microsoft.com/en-us/legal/cognitive-services/openai/data-privacy

https://learn.microsoft.com/en-us/azure/ai-services/content-safety/concepts/jailbreak-detection

https://learn.microsoft.com/en-us/azure/ai-services/content-safety/concepts/groundedness#groundedness-detection-features

https://learn.microsoft.com/en-us/azure/cognitive-services/openai/how-to/monitoring#monitoring-data

https://learn.microsoft.com/en-us/azure/azure-monitor/essentials/monitor-azure-resource#monitoring-data-from-azure-resources

I am actively seeking new opportunities and exciting challenges. If you would like to get in touch, please feel free to reach out through the following channels:

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Blog: https://zalnet.pl/blog/

X: https://x.com/beatazalewa

GitHub: https://github.com/beatazalewa/Conferences/