

State of .NET

State of the Microsoft Azure Cloud

Markus Egger

President and Chief Software Architect
CODE Magazine, CODE Consulting, CODE Staffing

Kicking Things Off

Jim Duffy

- Director of Business Development
CODE Magazine & Consulting
- Former Developer – Drawn to the Dark Side: Now Responsible for
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- jduffy@codemag.com / [My Bio](#)
- International Author and Speaker
- Former Microsoft RD (Regional Director) 9 years
- Former 11-time Microsoft Most Valuable Professional (MVP)
- Twitter: @jmduffy



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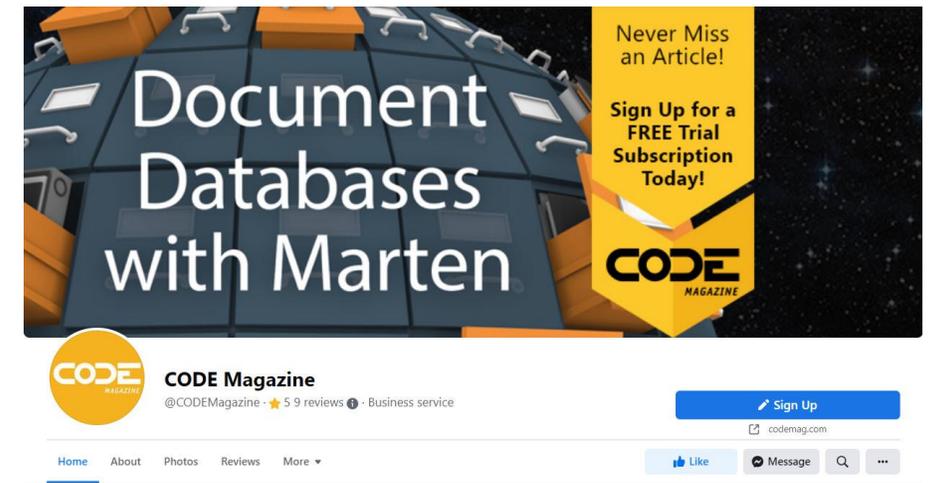
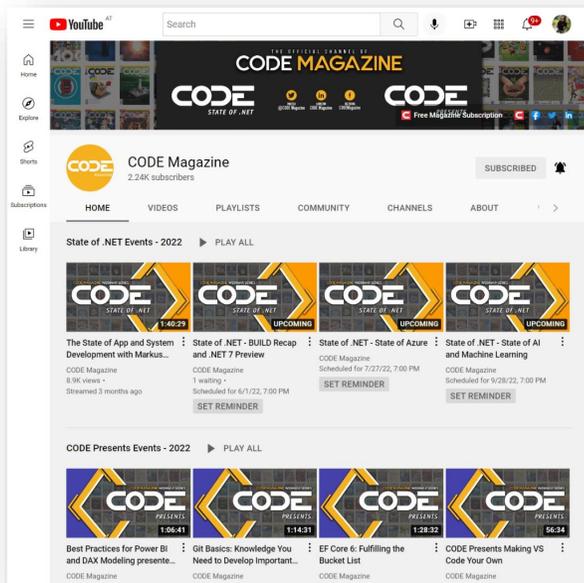
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State of .NET - State of Azure with Markus Egger

The survey will take approximately 4 minutes to complete.

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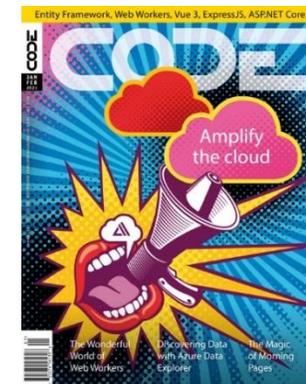
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About the Presenter

- **Markus Egger**
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EPS Software Corp. (dba CODE Consulting)
- Publisher – CODE Magazine
- International Author and Speaker
- Microsoft RD (Regional Director)
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Agenda

- Most current Azure numbers and facts
- Most important Azure services to know
- Strategies for moving to Azure
- AI & Machine Learning

 Welcome to 2030!

A New World – Welcome to 2030!

- The events of recent years have changed the IT landscape and expectations
 - ...and we are not going back
- This has changed the needs for software systems
 - Better connectivity, better remote access, more flexibility, security,...
- It is estimated that the adoption of new infrastructure has been accelerated by 5-7 years (or more)
- Clouds are a major enabler for this new challenge



The State of Azure

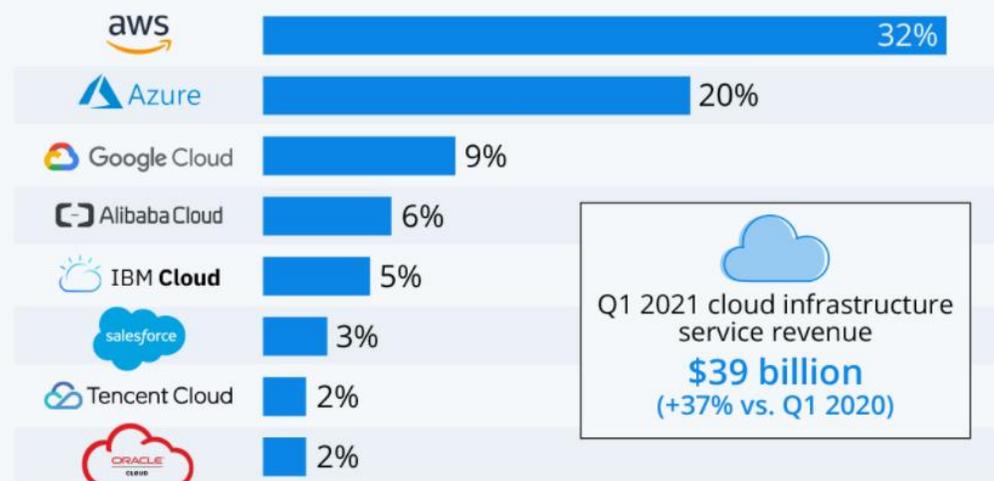
The State of Azure

- We have reached a point where the Cloud is well-established
- Azure is a stable offering in terms of available services
 - Things are evolving more gradually, and more linear than in the past
 - Microsoft is adding lots and lots of detailed features to services that have already been available for a while
 - Which is not to say that there isn't anything new 😊
- A considerable percentage of companies now utilize the Cloud for development efforts
 - Although not everyone

Azure Market Share: #2 and Growing

Amazon Leads \$150-Billion Cloud Market

Worldwide market share of leading cloud infrastructure service providers in Q1 2021*



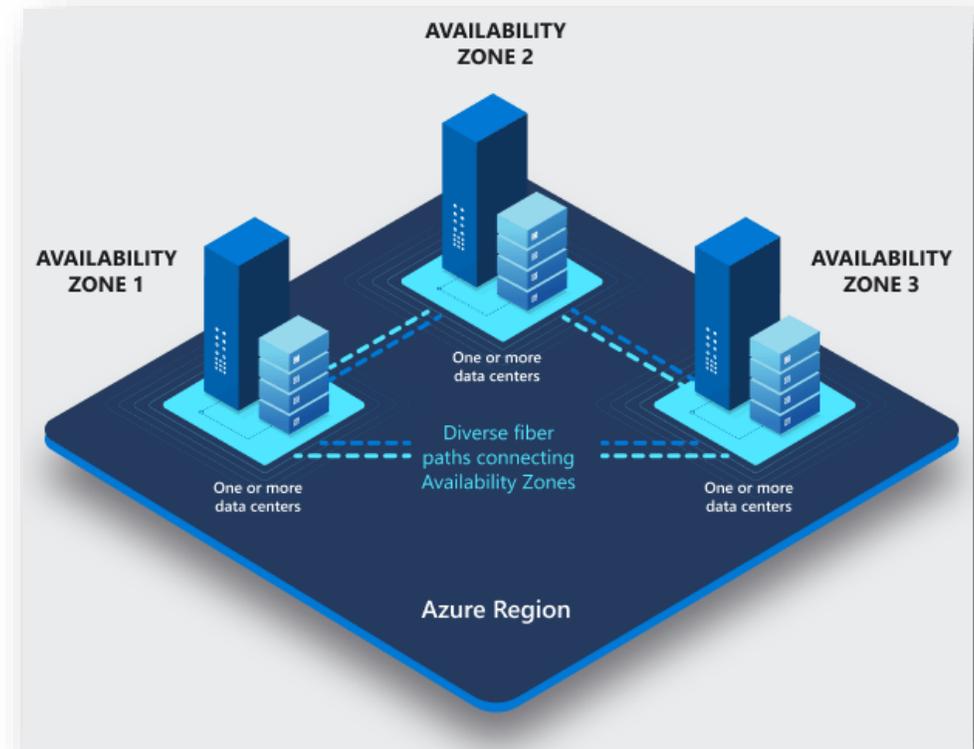
* includes platform as a service (PaaS) and infrastructure as a service (IaaS) as well as hosted private cloud services

Source: Synergy Research Group



Azure by the Numbers

- 78 data center regions
- More than 200 physical data centers
- 175,000 miles of fiber optics
- ...



Quincy



Cheyenne



Dublin



Amsterdam



Who is using the Cloud?

- Most Fortune 500 companies are utilizing Cloud services
 - Amazon says 80%+ of F-500 companies are using AWS
 - Microsoft says 95% of F-500 companies are using Azure
- Many small companies use the Cloud as an enabling technology and to level the playing field
- Who are the holdouts?
 - We see medium size companies, who had large previous investment in their own infrastructure

The Cloud and Security

- It is difficult to get real numbers, but by and large (anecdotally), different Cloud offerings seem to be vastly more secure than homegrown systems
- In many scenarios, the Cloud has fixed very specific security issues
 - Our own ability to recover from (and avert) a ransomware attack is a good example
- The fear that giving up your data to a large Cloud provider is going to be a problem, has not turned into a major threat
 - Azure Confidential Computing
 - Cloud providers have too much motivation to not get into their customer's data

Why We Like and Choose Azure

- We like the well-integrated and well-thought-out nature of the Azure setup
- Microsoft provides a very good overall list of services and features that maps well to the needs of our customers
- However: It is perfectly fine to choose other Clouds and mix and match. For instance: we also use AWS.



Azure Services

Azure App Service

- Fundamental service used to host web apps on Azure
- Windows and Linux
- Recent enhancements:
 - Google Remote Procedure Call (gRPC)
 - Bulk migration capabilities
 - Landing Zone Accelerator



App Services – Architectural Thoughts



It is perfectly fine to use Azure App Services “as is”

You do not always need to “containerize” your system, or add advanced orchestration



Consider Linux as a possible alternative scenarios

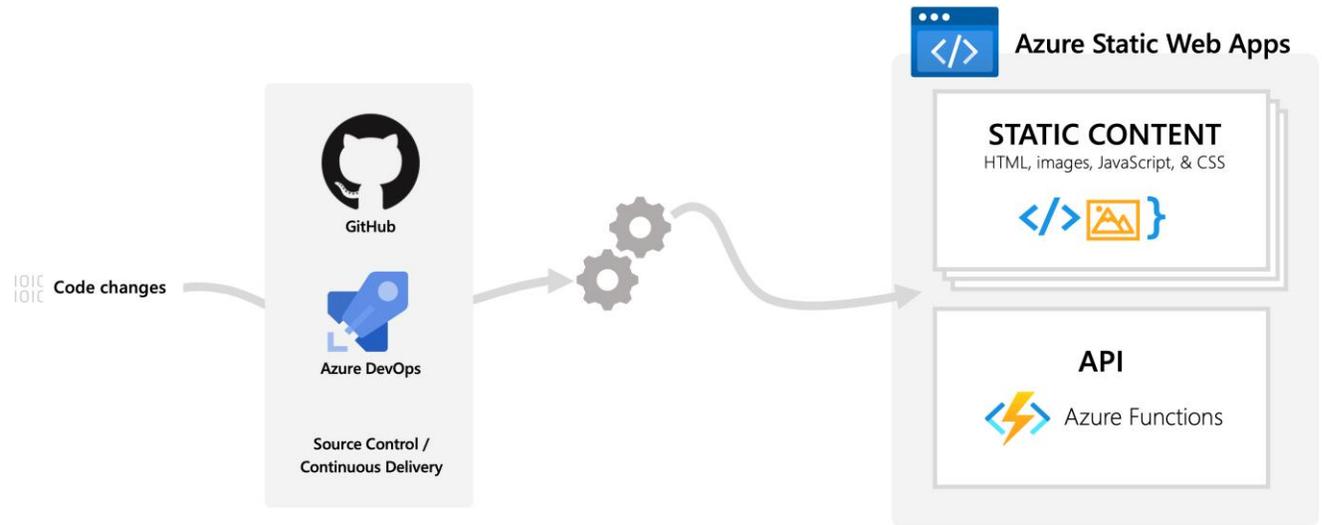
We managed to reduce expenses considerably by moving from Azure Windows App Services to Azure Linux App Services

In our case, the savings are roughly 75%

Moving to Linux is relatively easy. We only encountered some relatively minor issues (mostly around line-feeds).

Related Topic: Static Web Apps

- Many modern web apps do not require server-side processing
 - Examples: Angular, Vue,...
- Azure Static Web Apps provide a streamlined environment for hosting such sites
- Tight GitHub integration



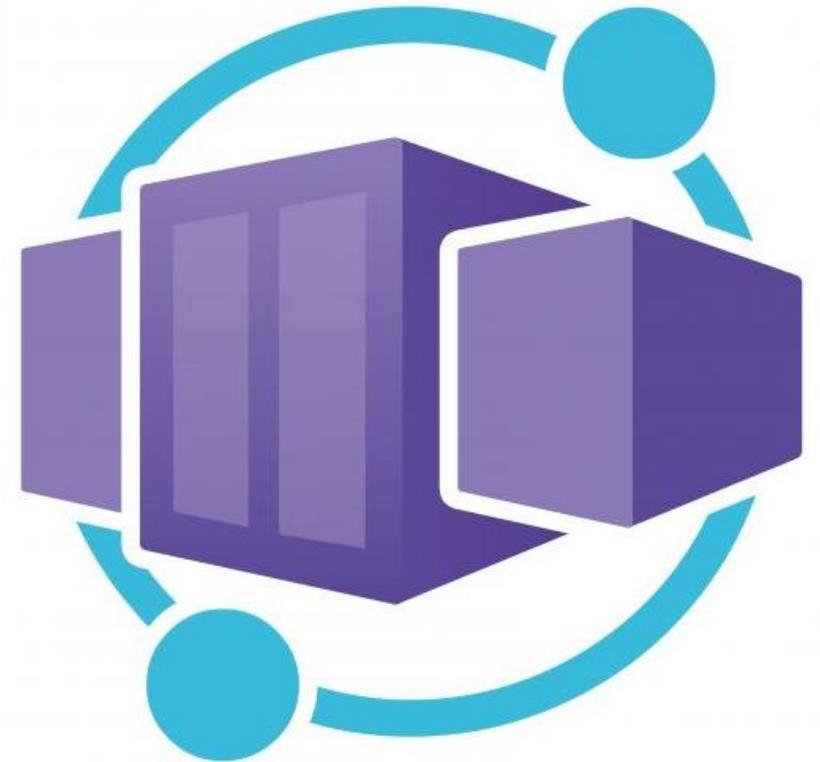
Azure Functions

- Serverless
 - Which most def. does NOT mean “no servers”. It just means you do not have to worry about the servers involved.
 - You will never be exposed to server provisioning or management
 - You simply say “Go ahead, Cloud!... Run this stuff of mine!”
- Event driven off HTTP, Queues, Timers, etc.
 - Great for simple jobs & workers
- Pay for resource usage
- Can be used for APIs



Azure Container Apps

- Serverless container solution
- Auto-scale (including “scale-to-zero”)
- Easier to use and deploy, compared to a typical Kubernetes setup
- However: Seamlessly upgrades to Kubernetes as needed



Azure Kubernetes Service

- Still a great way to set up container-driven environments
- Provides great control over containerized systems
- Enabled DevOps scenarios



Azure Kubernetes Service – Architectural Thoughts

- Azure Kubernetes Services is an incredibly powerful offering that is very useful for many scenarios...
- ...however, be aware that this adds a considerable amount of complexity, and the overall setups for this are generally much larger
- Not every system needs an orchestrated Kubernetes cluster!

Azure Storage

- Blobs, tables, queues & files
- Auto replicated & backed up
- Optional Geo-replication
- Think of this as a “limitless, high-performance, high-reliability file system in the cloud”
- Different tiers are available for cost-efficient storage

SQL Azure

- New version of SQL Server on Azure
- Microsoft Intelligent Data Platform
- Cool feature alert: Ledger support (Blockchain)



SQL Server – Architectural Thoughts

- Running SQL Azure is less expensive than a “conventional” instance in a virtual machine
- Note that there are some limitations (which – hopefully – should not matter in modern apps 😊)
 - No database diagrams
 - Certain (old) field types are not available
 - No Windows Authentication

Azure Cosmos DB Preview

- Increased serverless capacity to 1TB
- New 30-day free trial!



GitHub

- GitHub is rapidly becoming a lot more than “just a giant repository of code”
- GitHub is also becoming a lot more than “just a DevOps offering”
 - Note: Azure DevOps is still a perfectly viable product
- GitHub is starting to leverage the sum of their assets to drive much of the developer experience
 - Example: GitHub Copilot



Microsoft Dev Box

- Development environment in the Cloud
- Think of this as a remotely accessible VM in the Cloud, but one that is specifically created with developer's needs in mind
- This is currently in private preview

Migration Strategies

Migrating to Azure

- Moving to the Cloud is often simpler than you'd think
- Creating VMs as a first step is a key ability for gradual migration
- Migrating services and web apps is extremely easy
- Hybrid scenarios help (and Microsoft is especially good at that)
- Windows 365 may be a good way to gradually migrate desktop applications

Cloud Native

- “Cloud Native” is first and foremost a way to think about development
- Creating systems that are fundamentally built on cloud concepts
- The Cloud Native Computing Foundation defines it as:
 - *“Cloud-native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.”*

“Conventional Apps”

- Your system doesn't have to be 100% “cloud-native” to take advantage of many of the cloud offerings
- It is perfectly fine to use bits and pieces of Azure (or any other cloud) to enhance your current apps and systems

A AI



Azure AI

- AI is becoming more and more important in many scenarios
 - It is more difficult to think of scenarios that *can't* benefit from AI, than it is to think of scenarios that can
- Microsoft is launching more and more turn-key AI services
- Microsoft is also enabling fundamental AI & Machine Learning development in a variety of ways

Models as a Platform

- Microsoft AI
 - Turing – Rich language understanding
 - Z-Code – 100 languages translation
 - Florence – Breakthrough visual recognition
- OpenAI
 - GPT – Human-like language generation
 - DALL-E – Realistic image generation
 - Codex – Advanced code generation

Azure OpenAI Services

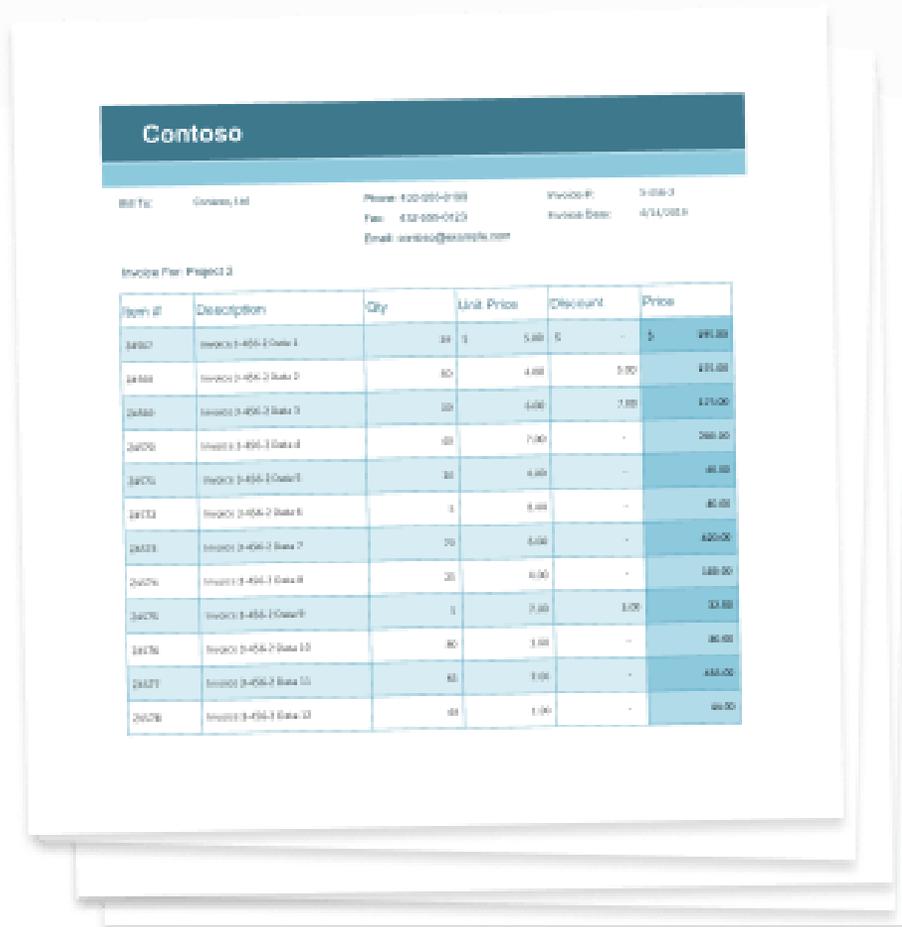
- New reasoning and comprehension capabilities for text-based scenarios
- Examples: Writing assistance, code generation, making sense of unstructured data
- Now available as a limited access preview

Cognitive Service for Language

- Natural Language Processing (NLP)
- Examples:
 - Named entity recognition (NER)
 - Key phrase extraction
 - Summaries, language detection
 - Sentiment analysis
 - ...
- <https://docs.microsoft.com/en-us/azure/cognitive-services/language-service/overview>

Azure Form Recognizer

- Another great example for a pre-trained model that has recently been improved
- Very useful service for business application scenarios



The image shows a scanned invoice from Contoso. The invoice is for Project 2 and lists various items with their quantities, unit prices, discounts, and total prices. The items are categorized by data type (Data 1 through Data 12).

Item ID	Description	Qty	Unit Price	Discount	Price
24007	Invoice 0-456-1 Data 1	24	5.00	5	108.00
24008	Invoice 0-456-2 Data 2	20	4.00	5.00	75.00
24009	Invoice 0-456-3 Data 3	20	4.00	7.00	72.00
24010	Invoice 0-456-4 Data 4	20	7.00	-	140.00
24011	Invoice 0-456-5 Data 5	20	4.00	-	80.00
24012	Invoice 0-456-6 Data 6	1	8.00	-	8.00
24013	Invoice 0-456-7 Data 7	70	6.00	-	420.00
24014	Invoice 0-456-8 Data 8	20	6.00	-	120.00
24015	Invoice 0-456-9 Data 9	1	3.00	1.00	2.00
24016	Invoice 0-456-10 Data 10	20	3.00	-	60.00
24017	Invoice 0-456-11 Data 11	20	3.00	-	60.00
24018	Invoice 0-456-12 Data 12	20	3.00	-	60.00

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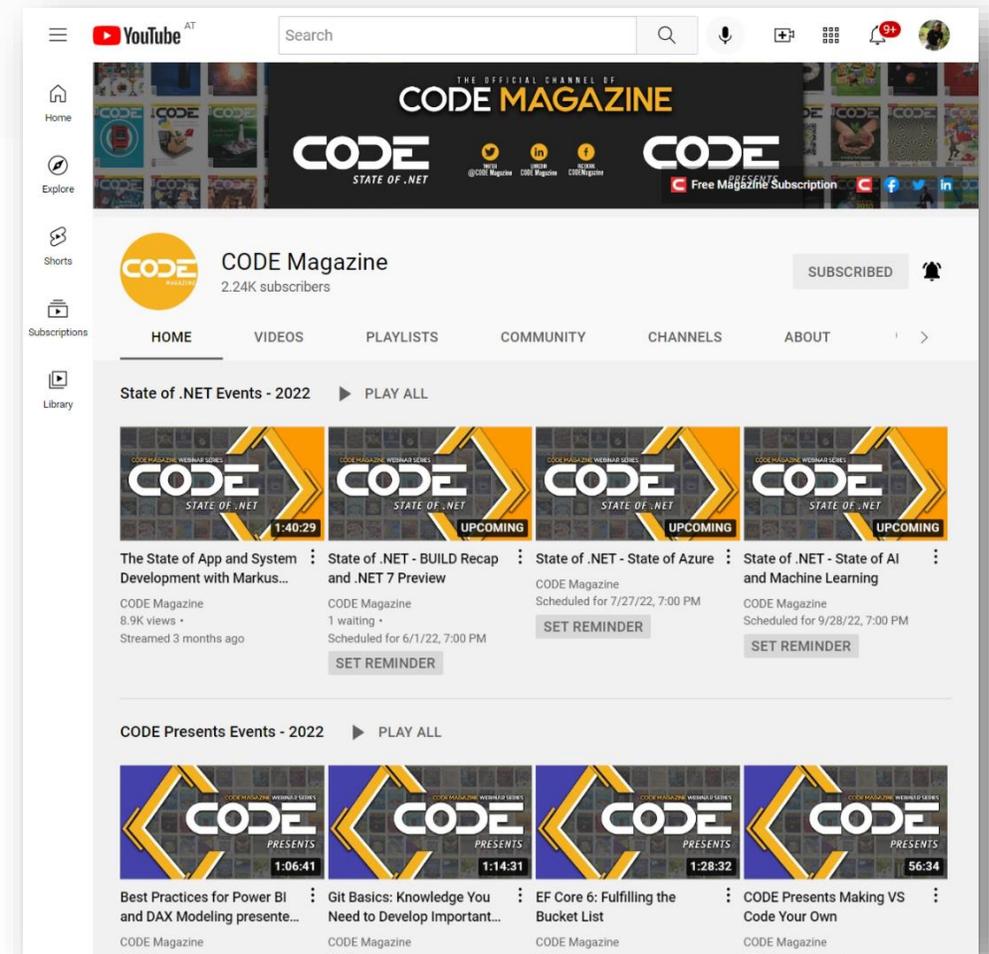
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Q&A

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