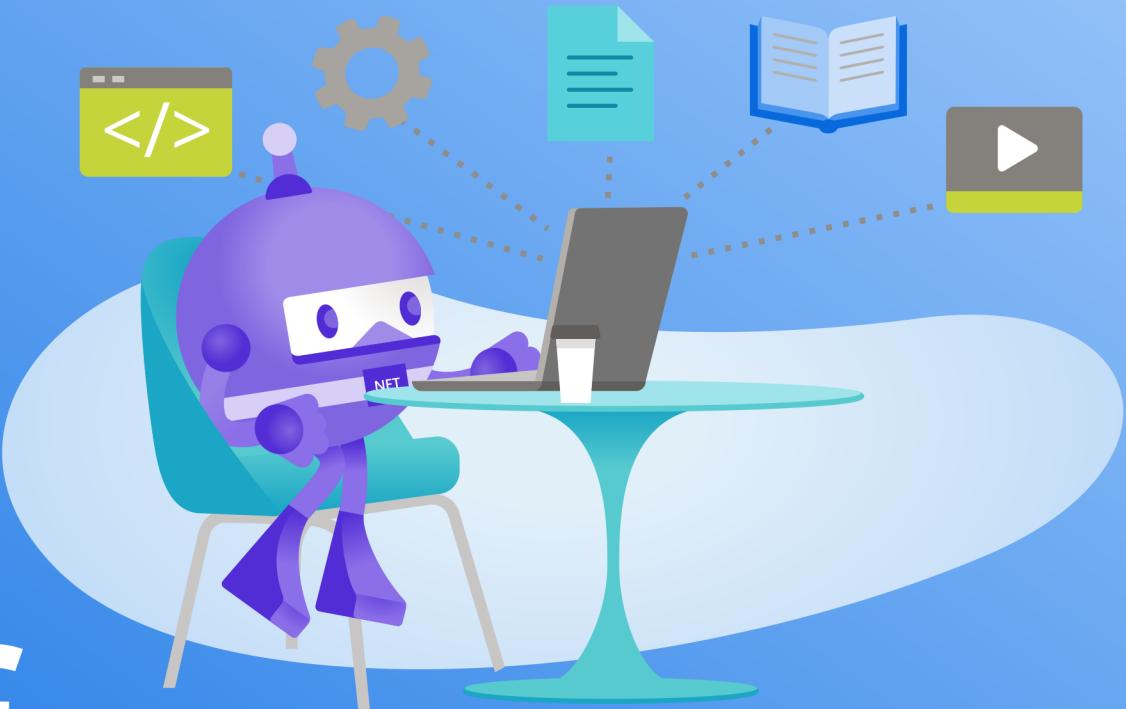


.NET Conf

Focus on Windows

February 25, 2021

focus.dotnetconf.net



Real-Time Desktop Apps with SignalR

Sam Basu | [@samidip](https://twitter.com/samidip)

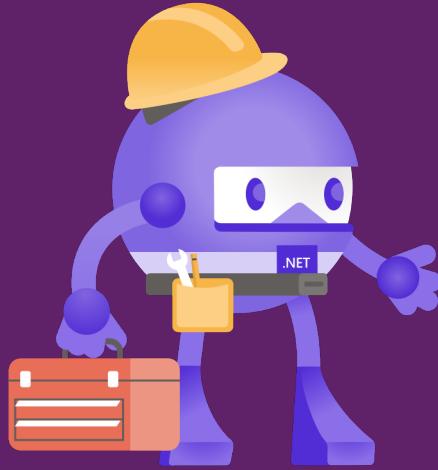
Developer Advocate | Progress Telerik





I'm old. I'm not cool.
But I still try ...

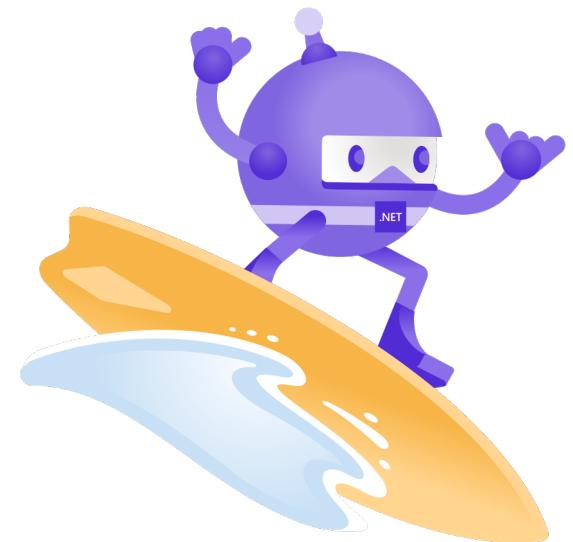




Building for Desktop

Targeting Windows

- ❖ Windows Forms (WinForms)
- ❖ Windows Presentation Foundation (WPF)
- ❖ Universal Windows Platform (UWP)
- ❖ Windows UI (WinUI)
- ❖ Progressive Web Apps (PWAs)
- ❖ Electron Shell
- ❖ WPF Renderers for Xamarin.Forms
- ❖ Blazor Mobile Bindings 🤘
- ❖ .NET MAUI through WinUI 🎉



Reaching Mac OS/Linux

- ❖ Electron Shell
- ❖ Xamarin.Mac
- ❖ Mac OS Renderers for Xamarin.Forms
- ❖ Blazor Mobile Bindings 🤘
- ❖ .NET MAUI through Mac OS Catalyst 🙌
- ❖ GTK# Linux Renderers for Xamarin.Forms

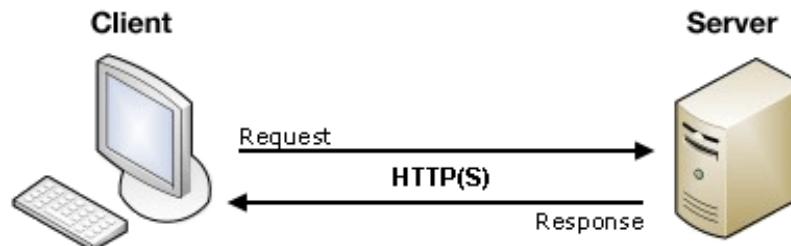


Real-Time Communications?



Hyper Text Transfer Protocol

- Crux of it all
- Lots of optimizations
- Fundamentals remain same



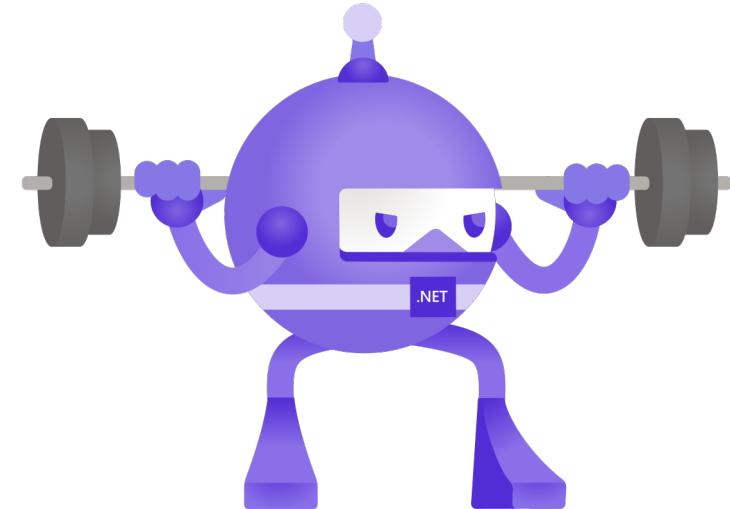
Real-Time Communication Needs

- ❖ Chat .. Duh!
- ❖ Stock Tickers
- ❖ Live Auctions/Polls
- ❖ Sports/News Updates
- ❖ Collaboration
- ❖ Games
- ❖ Location services
- ❖ Progress Indicators
- ❖ And many many more ..

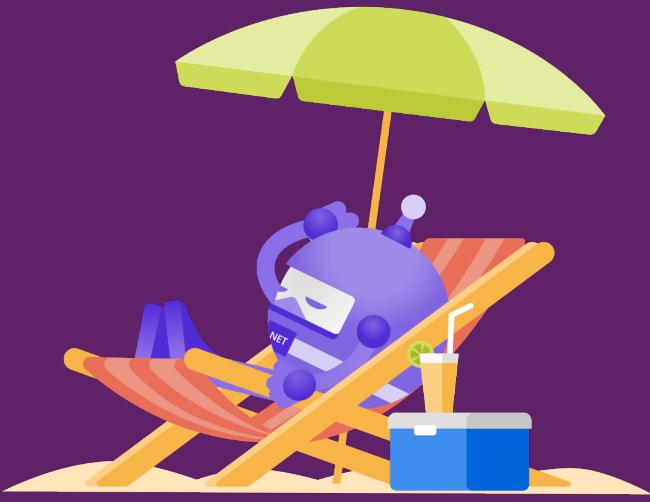


Real-Time Challenges

- This is hard
- Transcends technology stacks
- Varying platforms/devices
- Web apps want to be Stateless
- Bandwidth & Data limits
- Network failures
- Data loss



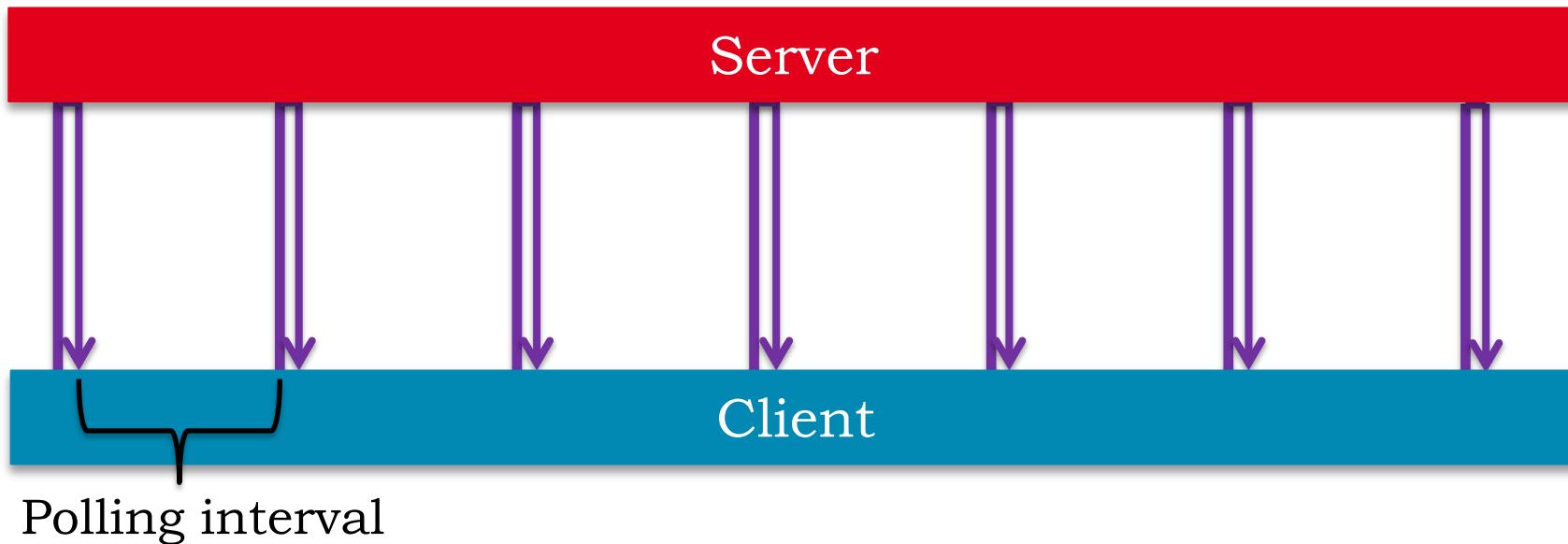
Wishlist: Open transport channel between client-server, for bidirectional or full-duplex communications.



Some Solutions

Regular Polling

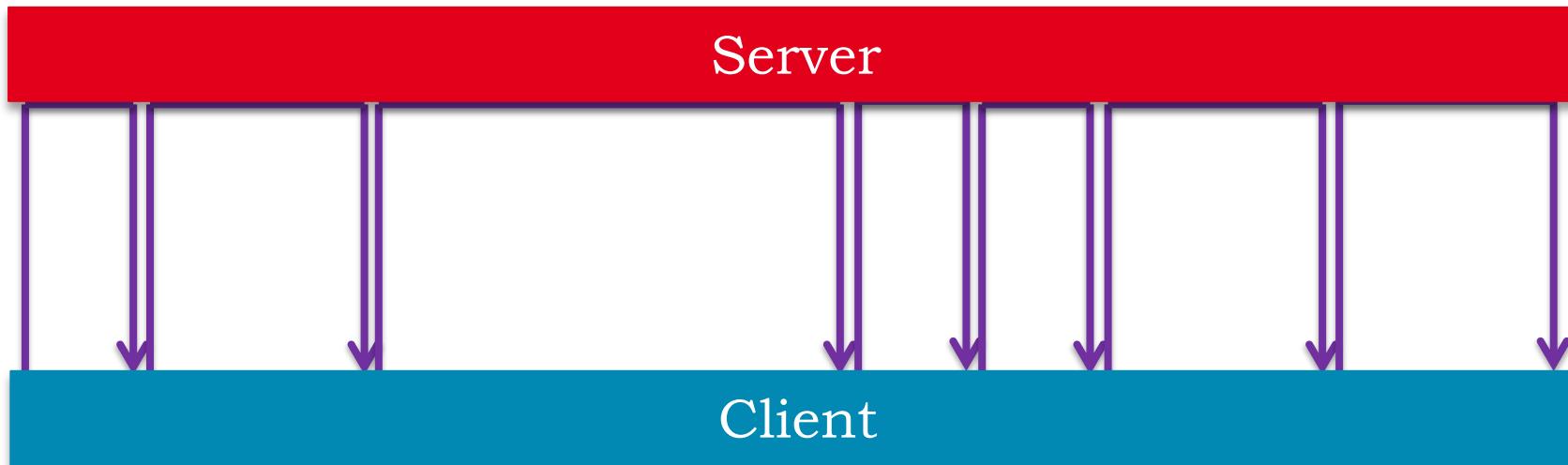
Periodic/Ajax Polling



Not real-time | Unnecessary trips

Long Polling

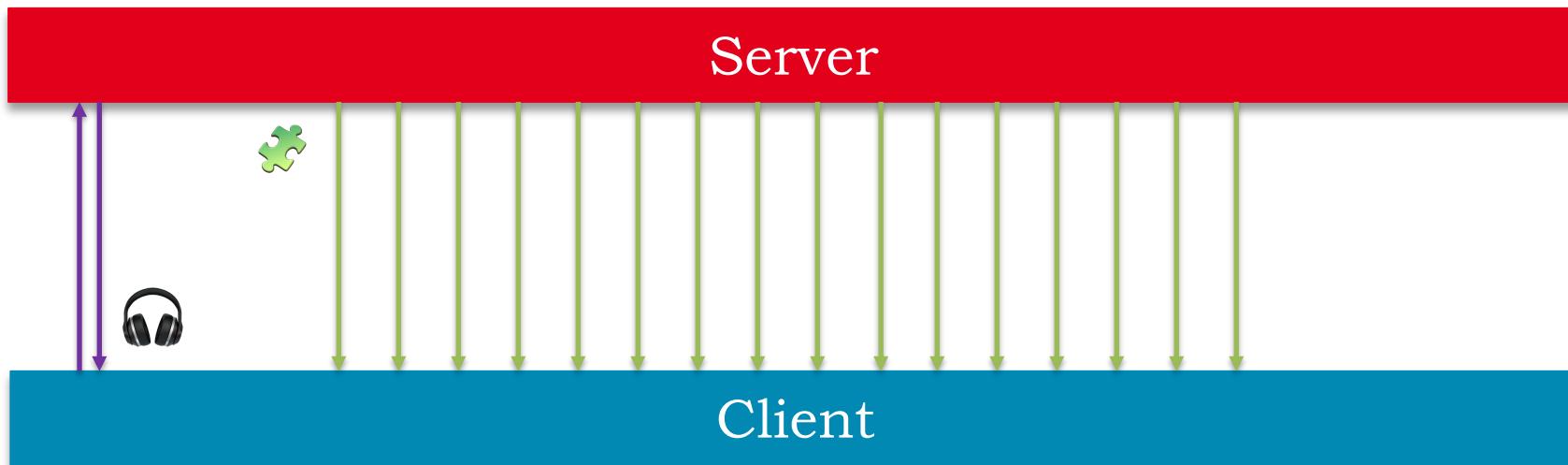
- Server does not respond unless something happens
- Client polls after receiving data or timing out



Needs orchestration | Custom code on either end

Server Sent Events

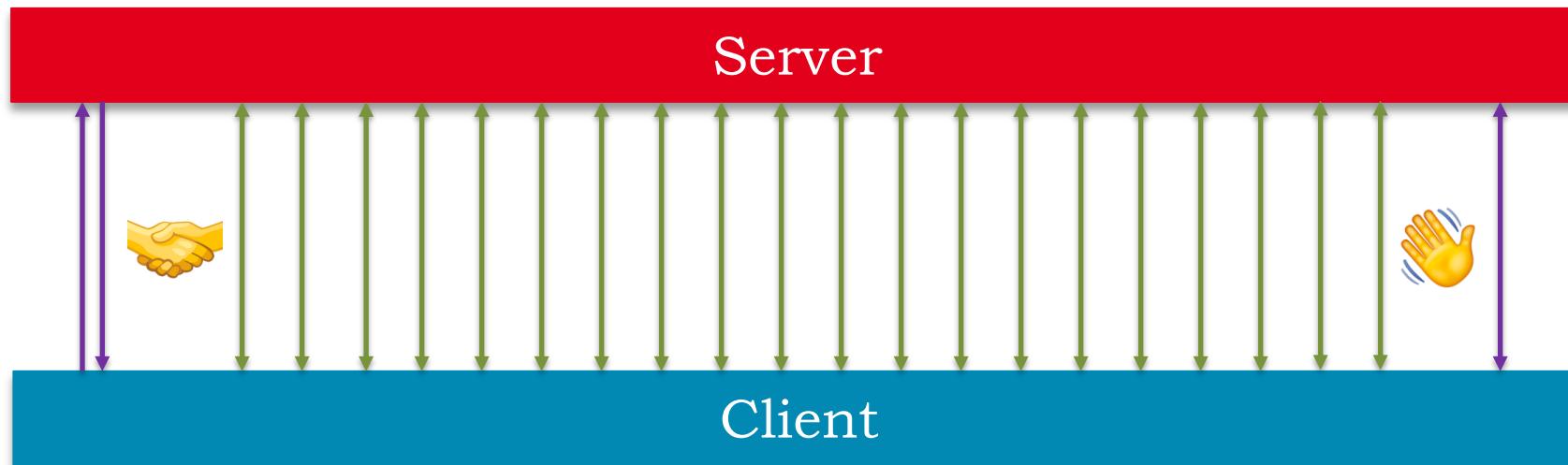
- One directional push from server
- Client subscribes to server notifications



Support varies by platform | Needs timeout/reconnection

Web Sockets!

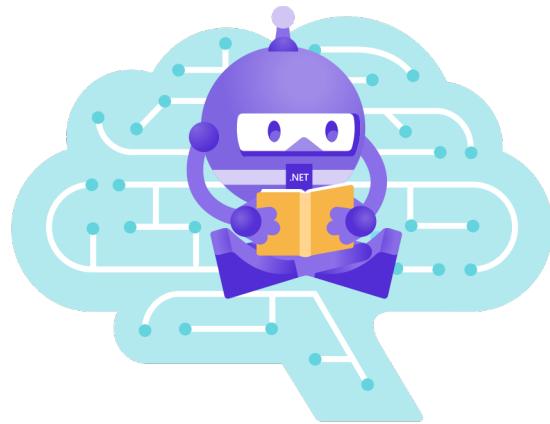
- HTML 5 Magic Unicorn stuff for low latency exchanges
- Persistent connection for bi-directional communications



Support varies by platform | Needs timeout/reconnection

Few Other Options

- Flash sockets – Best not to talk about Plugins
- Forever Frames – Script blocks in hidden IE iFrame
- gRPC – Universal ProtoBuf RPC Framework

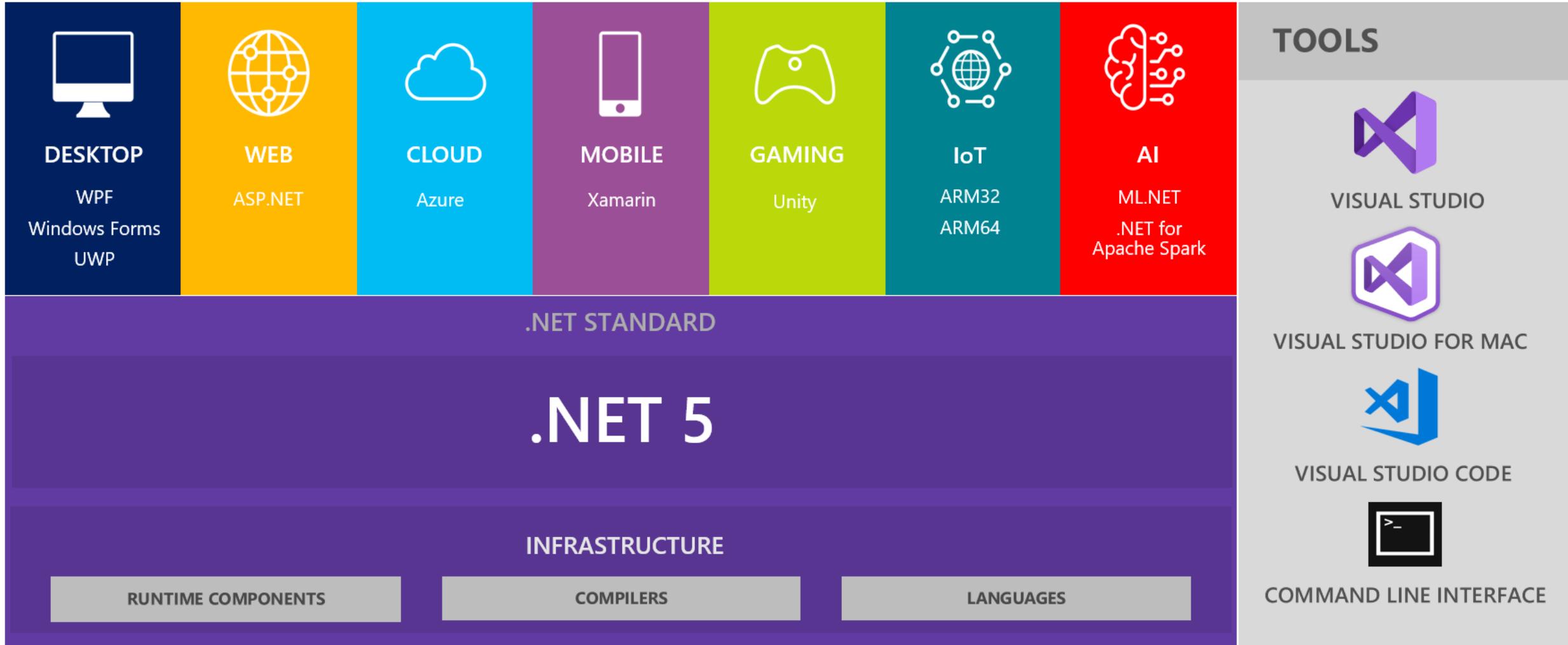


Transport layer takes work | Nothing is perfect | Custom logic needed



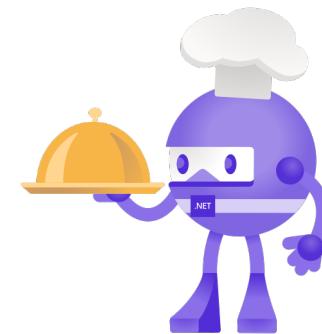
SignalR Across Platforms

.NET – Today



SignalR Basics

- ✓ For both ASP.NET & ASP.NET Core
- ✓ Allows for easy addition of Real-Time communications
- ✓ Wrapper so developers can be worry free about network
- ✓ Chooses best Transport
- ✓ Handles connection management
- ✓ APIs for client management
- ✓ Supports variety of platforms
- ✓ Scales nicely with some orchestration
- ✓ Open Source



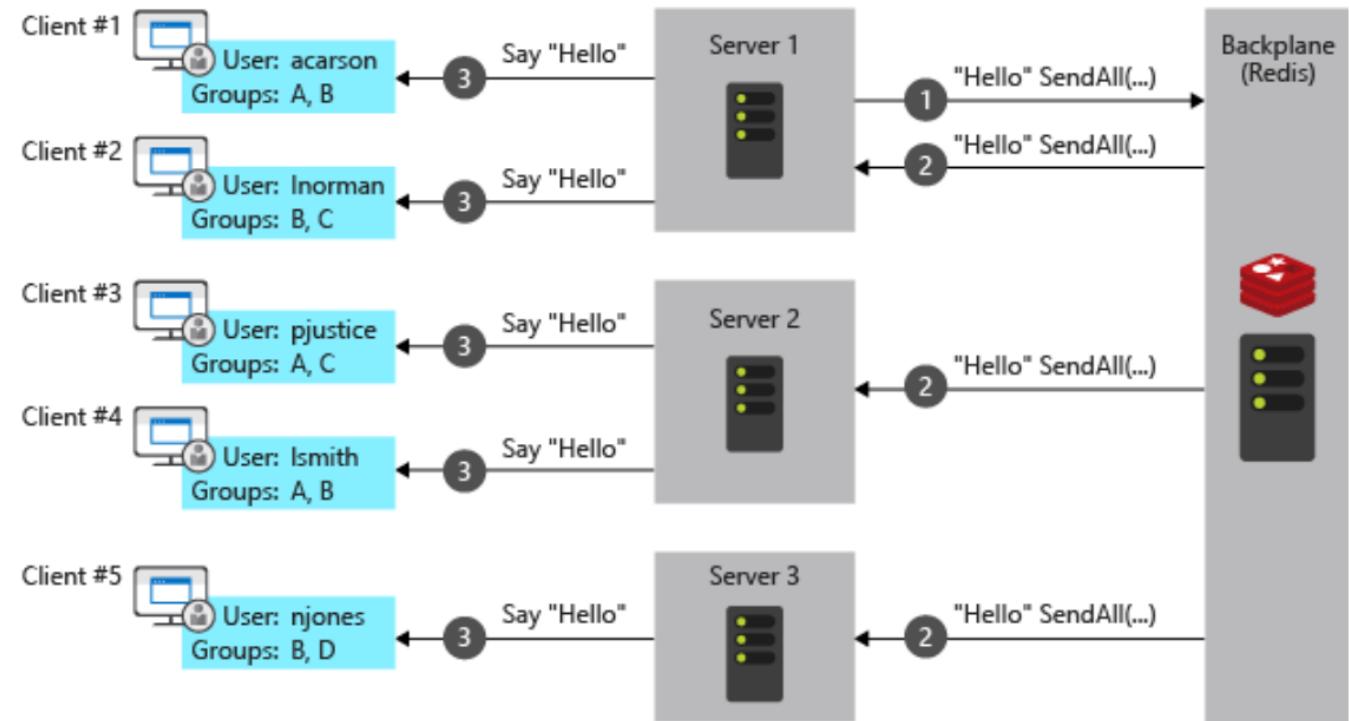
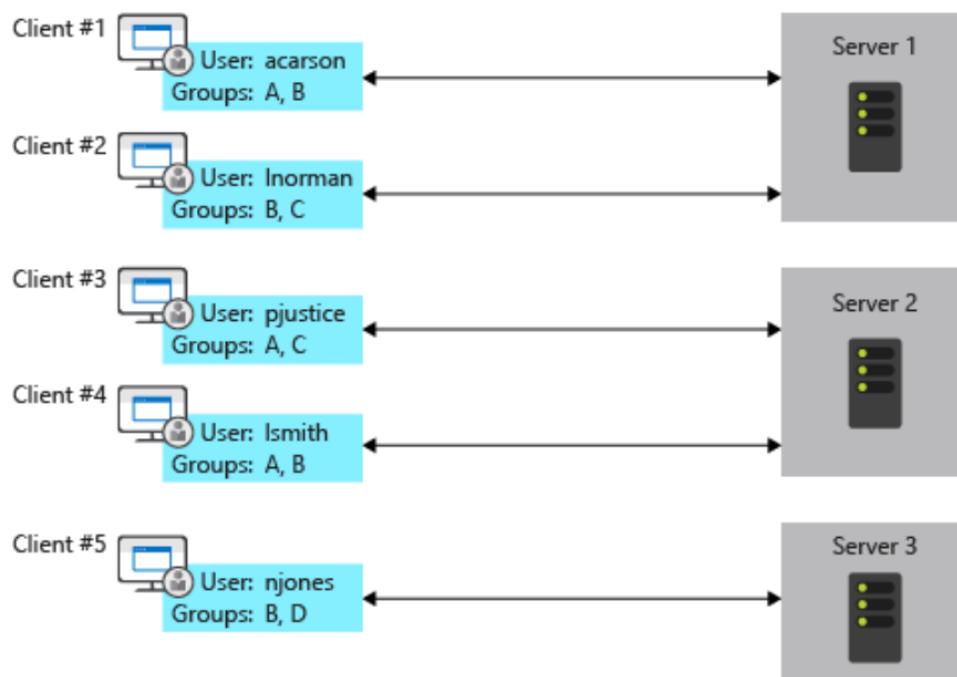


SignalR Hubs



- Hub of communication between server-client
- Server & Clients can call Methods on each other
- Hubs manage Clients & network Context
- Support for magic strings or strongly typed parameters
- Choices in Hub data transfer protocols
- Built-in – Text protocol based on JSON/NewtonSoft.JSON
- Alternative - MessagePack for Binary Serialization/De-Serialization
- Essentially Middleware for ASP.NET Core
- Options for Configurations, Security, Logging, Streaming & more

Scaling SignalR



Redis Backplane – In-memory DB | Maintains key-value pairs | Tracks connections across servers



Microsoft Azure



Tools

Developer

DevOps

Management



Serverless

Web

Mobile

Functions

Containers

Integration services

Databases

AI + Machine Learning

Analytics

Internet of Things

Media



Infrastructure

Compute

Networking

Storage

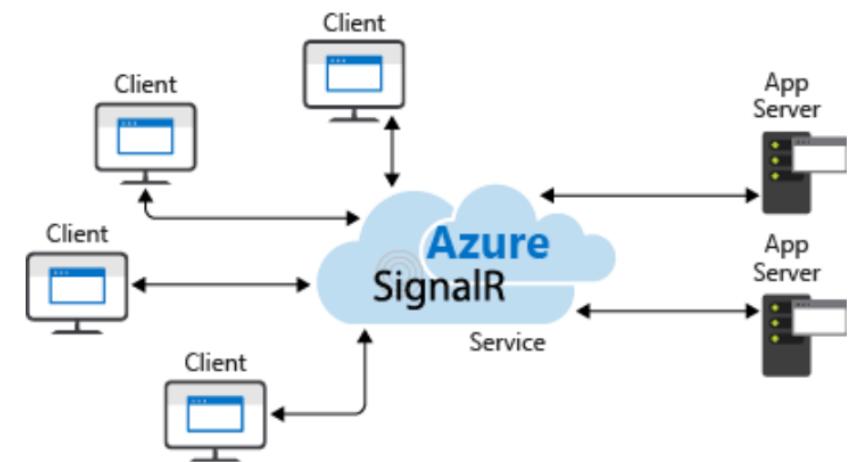
Security

Identity

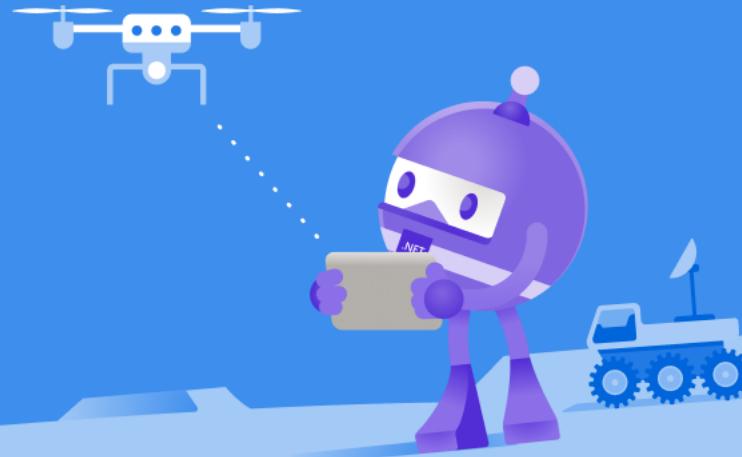
Azure SignalR Service



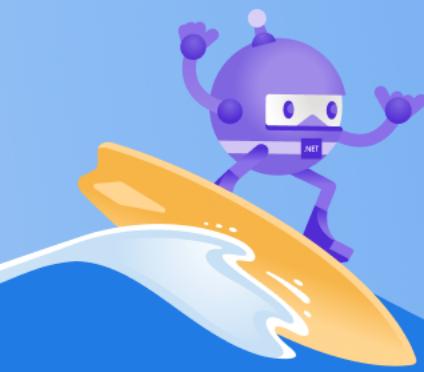
- ❖ Infinite Scale with client connections
- ❖ Managed SignalR Hosting | Service acts as Proxy
- ❖ Broad client platform support
- ❖ Great with Serverless architectures
- ❖ Use full spectrum of other Azure services
- ❖ Provides REST API for easy manageability



Time for some Demos ..



Developer choices for Desktop





Real-Time Workflows with SignalR



Thanks for joining!

Ask your questions live on Twitter | #dotNETConf

Let's keep chatting | @samidip

