How is the Windows.Foundation.Uri.Domain property different from Host?

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The Windows Runtime class `Windows.Foundation.Uri` has two string properties: `Host` and `Domain`. What's the difference?

Let's start with `Host`. This is the "host" as defined in <u>RFC 3986</u> which defines the syntax for URIs.

Okay, that was easy. What about `Domain`?

The `Domain` is an attempt to identify the part of the `Host` that was registered with a top-level domain (TLD) registrar.

Host	Domain
example.com	example.com
mail.example.com	example.com
www.bbc.co.uk	bbc.co.uk
bbc.co.uk	bbc.co.uk

The code for the `Domain` property applies a bunch of rules to determine how many levels of the fully-qualified domain name should be used to determine the "domain".

The problem is that the authority for these rules is "whoever runs the TLD". We see that different TLDs have different policies: The `.com` TLD allows organizations to register second-level domains, whereas the `.uk` TLD registers organizations as third-level domains, under `.co.uk`. There is no standard for how each TLD assigns its domains; each TLD can choose whatever pattern it likes.

What's more, there's no requirement that a TLD stick to the pattern it chose originally, or even have a pattern at all. For example, the `.br` TLD (waves hello in Brazilian Portuguese) originally registered organizations under the third level, so you got names like `contoso.com.br`, but it then decided to allow organizations (primarily universities) to register as second-level domains. This means that if you are given a domain under `.br`, you have to look at the second-level domain and see if it's on a list of known reserved second-level domains such as `com.br` for commercial organizations or `slg.br` for (checks notes) sociologists. If so, then the third-level domain is the organizational domain; otherwise, you have an organization that was granted a second-level domain.

There are over 100 defined reserved second-level domains under `.br`, and I suspect that the list has grown even longer while I was sleeping. It's practically impossible to keep up with all of these changes in TLD policy around the world, so what you get from the `Domain` property is a best-guess at the organizational domain. And at least for the `.br` TLD, it's definitely not completely up to date. For example, it thinks that the organizational domain for `mail.contoso.tec.br` is `tec.br` instead of `contoso.tec.br`.

So what is `Domain` good for?

I'm not sure. It's trying its best, but the world is too complicated.