Using the Semantic Model

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Module Outline

The problem with the attribute

- Only its name is checked
- What is the semantic model?

Use the semantic model

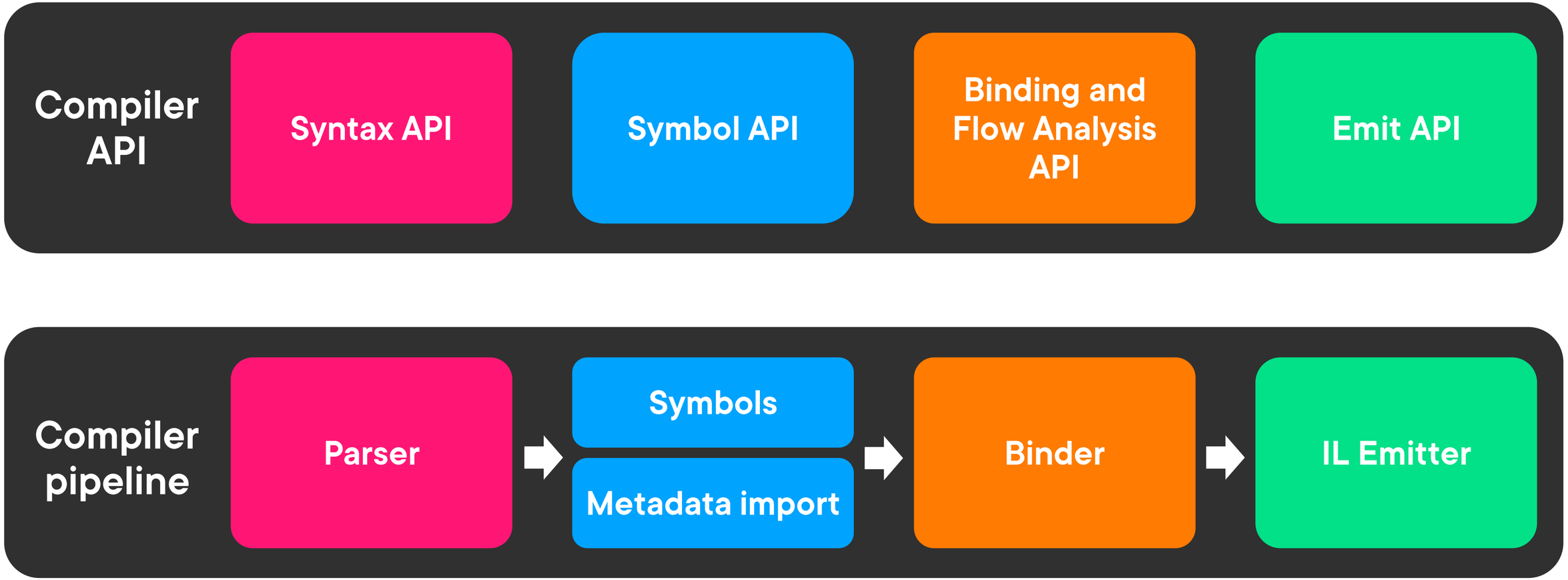
- Check the attribute
- Iterate over the members of a class

Analyze the performance of the source generator

The problem with the attribute

What Is the Semantic Model?

What Is the Semantic Model?



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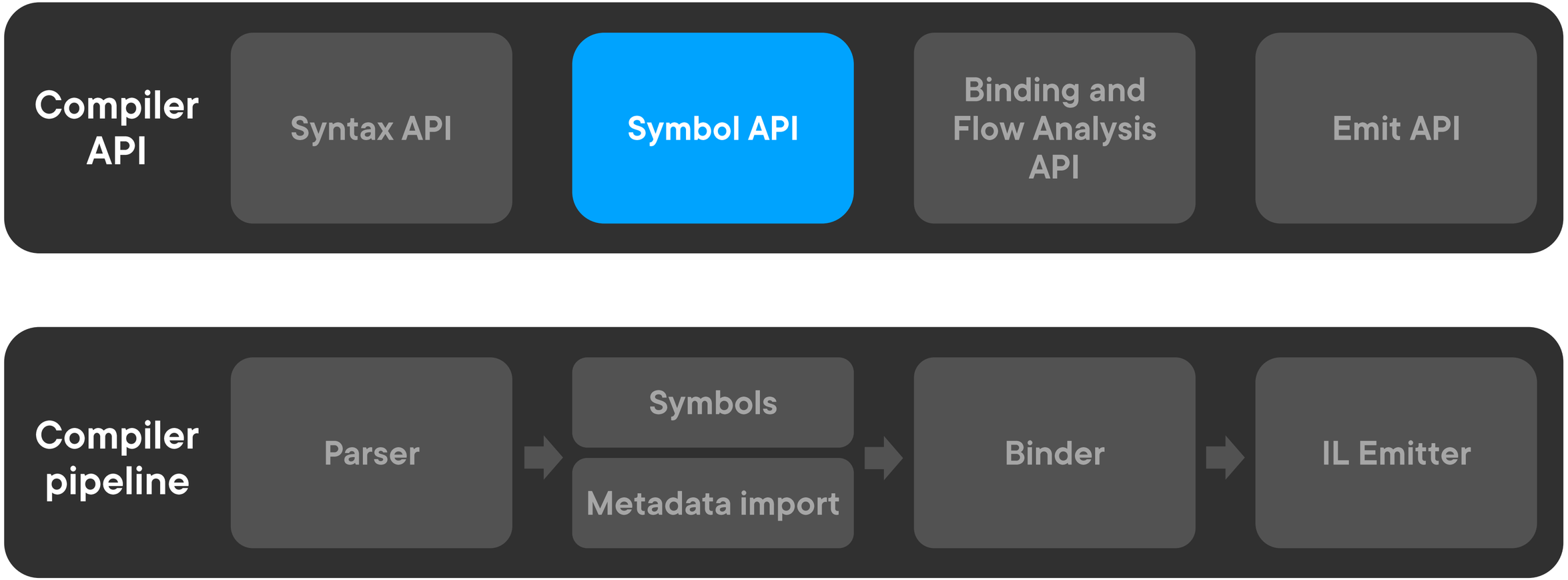

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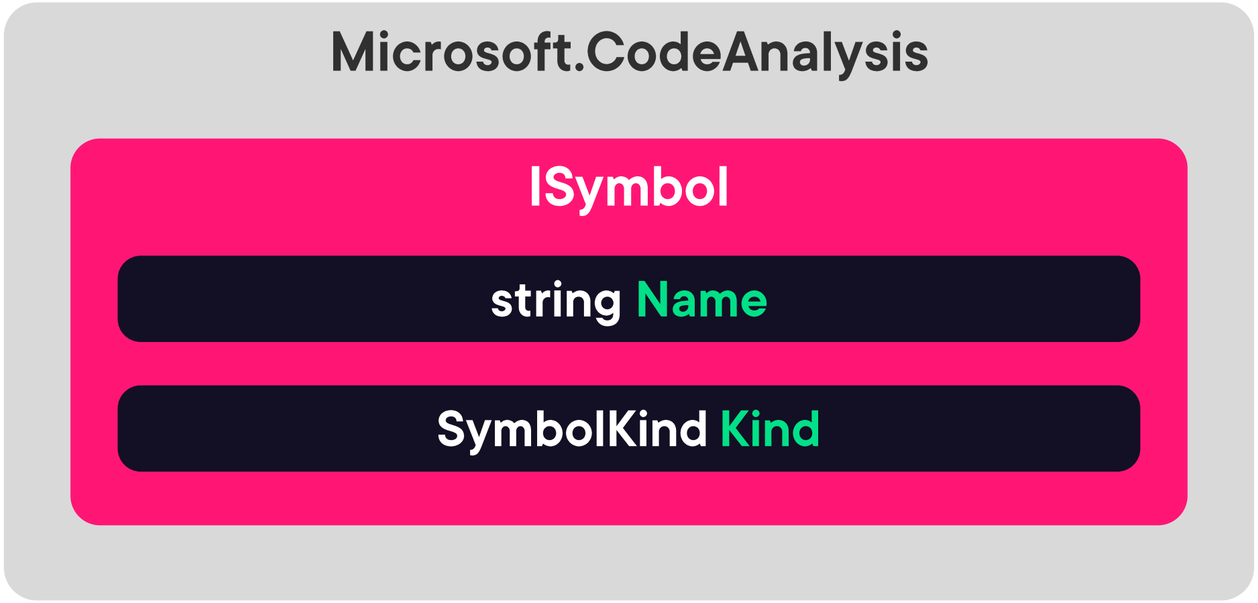

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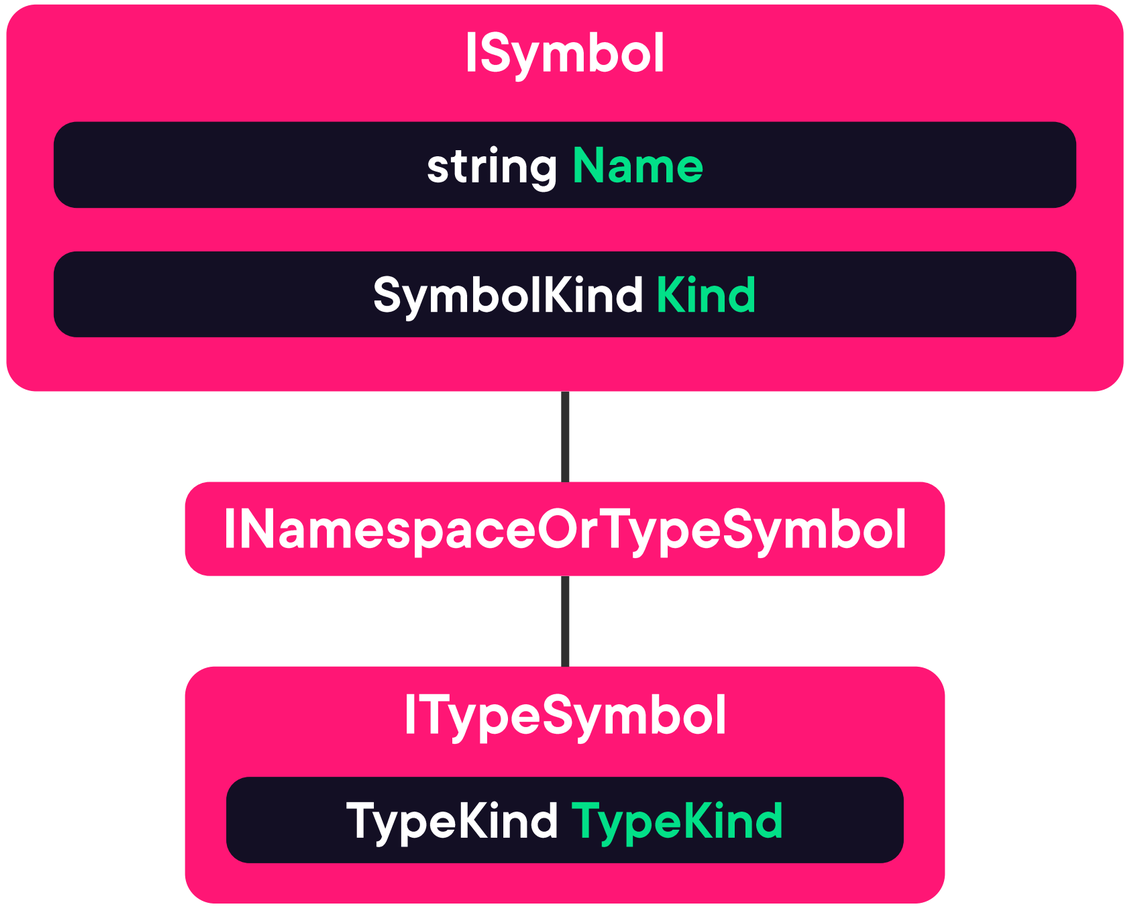

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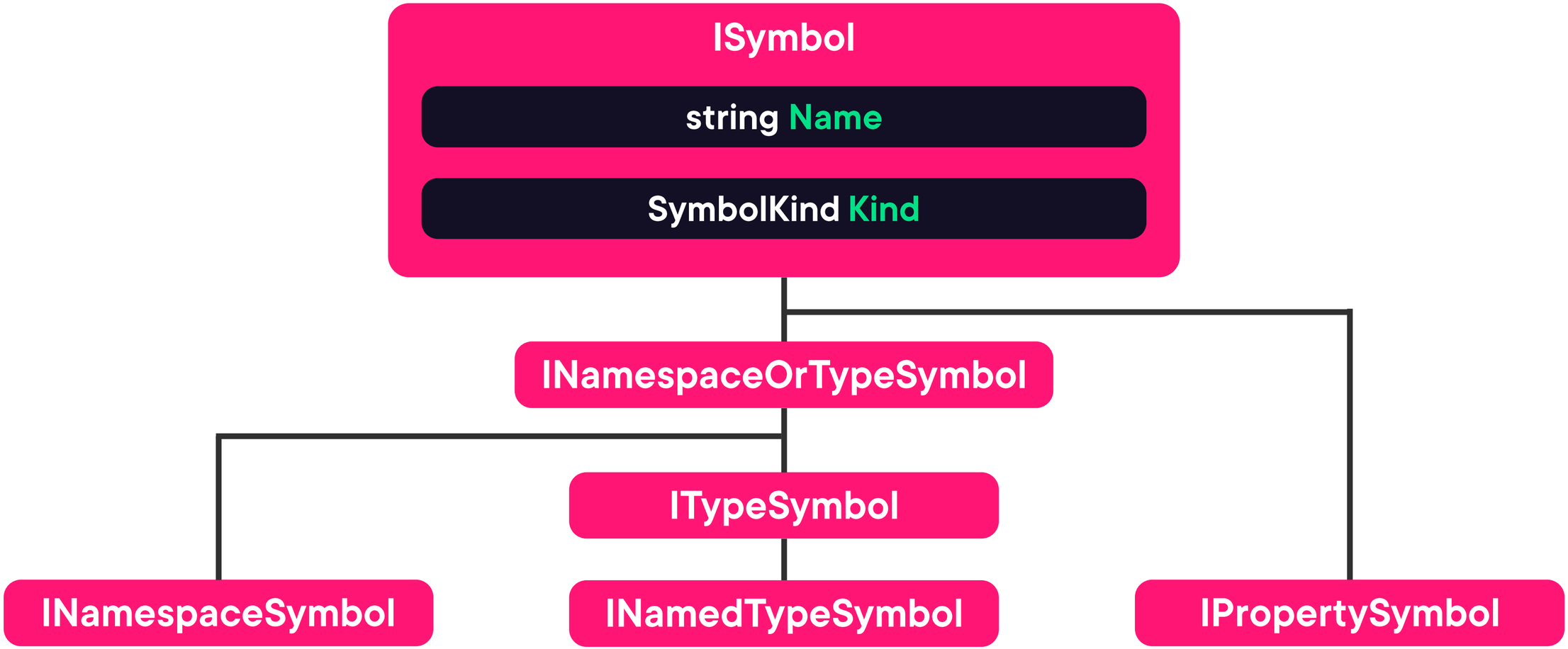

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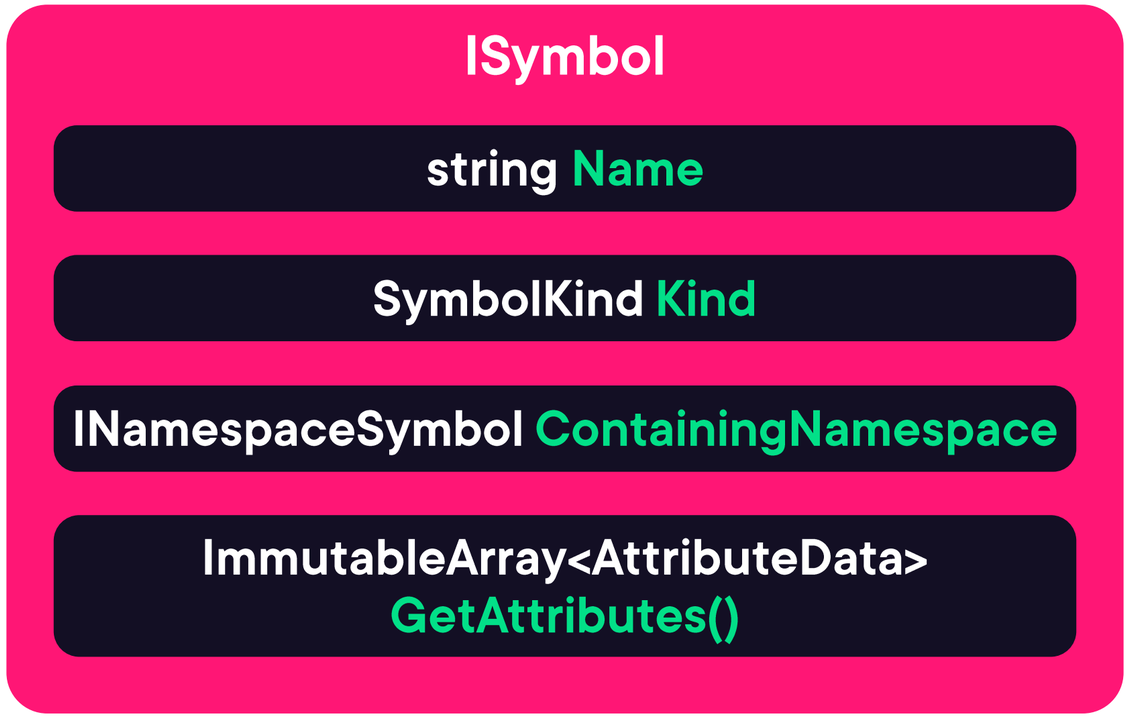


The semantic model is like working with types and reflection

What Is the Semantic Model?

```
public void Initialize(IncrementalGeneratorInitializationContext context)
{
    var classes = context.SyntaxProvider.CreateSyntaxProvider(
        predicate: static (node, _) => IsSyntaxTarget(node),
        transform: static (ctx, _) => GetSemanticTarget(ctx))
        .Where(static (target) => target is not null);
    ...
}

private static ClassDeclarationSyntax? GetSemanticTarget(
    GeneratorSyntaxContext context)
{
    var classDeclarationSyntax = (ClassDeclarationSyntax)context.Node;
    ...
}
```

What Is the Semantic Model?

GeneratorSyntaxContext

- SyntaxNode Node
- SemanticModel SemanticModel

SemanticModel

- ISymbol GetDeclaredSymbol(SyntaxNode)
- Compilation Compilation

What Is the Semantic Model?

SemanticModel

ISymbol GetDeclaredSymbol(SyntaxNode)

Compilation Compilation

Compilation

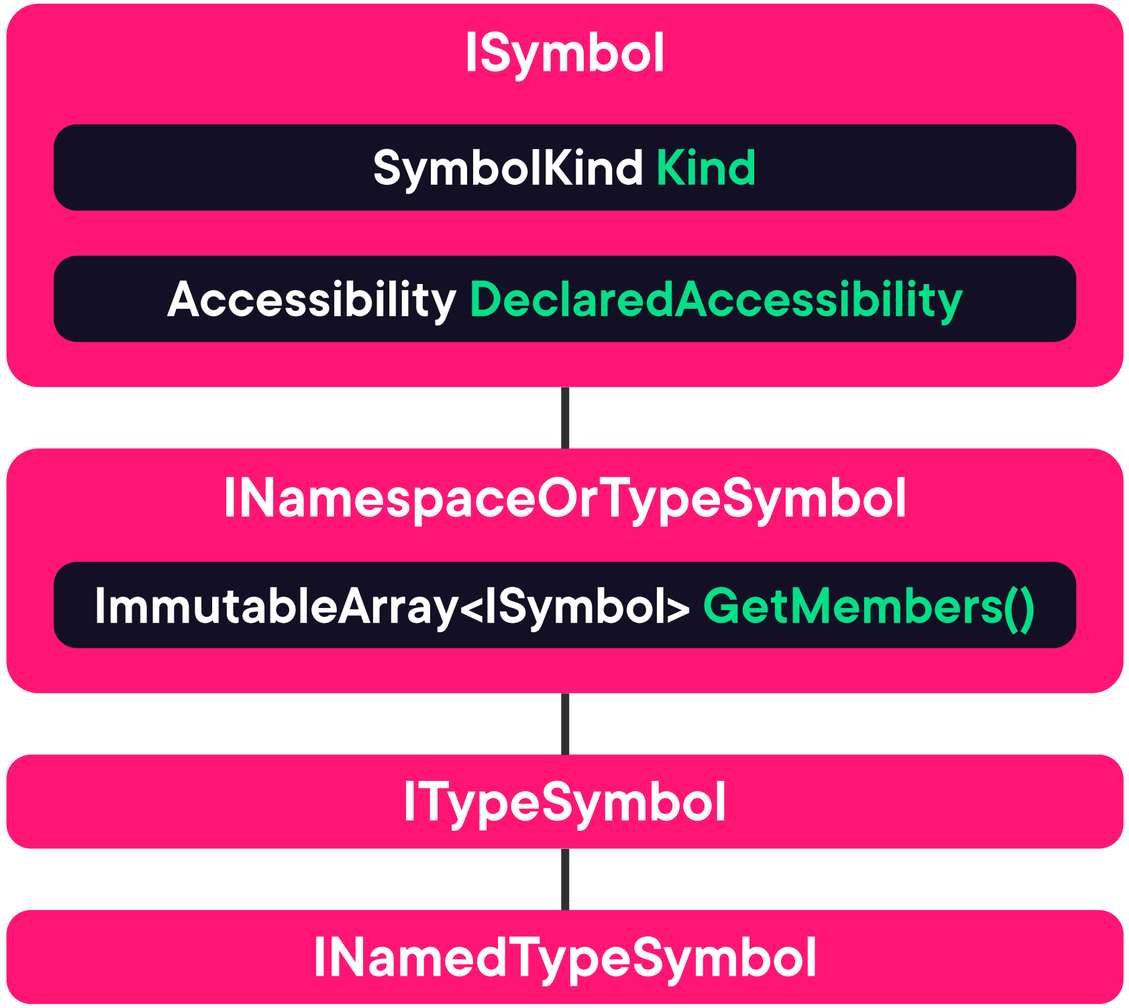
INamedTypeSymbol?
GetTypeByMetadataName(
string fullyQualifiedMetadataName)

Check the attribute with the semantic model

Another case for the semantic model

Create and use a model

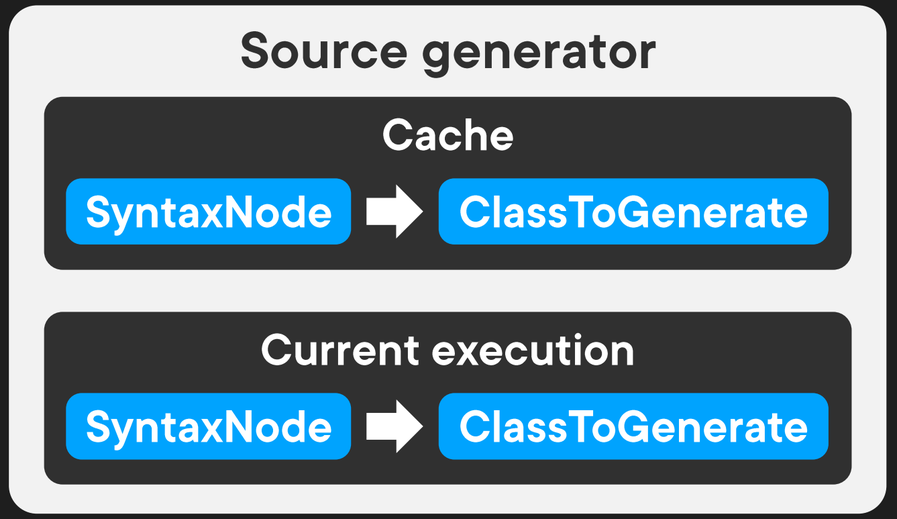
Iterate Over the Members



Iterate over the members

Analyze the performance

Understand How the Cache Works




```
public void Initialize(IncrementalGeneratorInitializationContext context)
{
    var classes = context.SyntaxProvider.CreateSyntaxProvider(
        predicate: static (node, _) => IsSyntaxTarget(node),
        transform: static (ctx, _) => GetSemanticTarget(ctx))
        .Where(static (target) => target is not null);

    context.RegisterSourceOutput(classes,
            static (ctx, source) => Execute(ctx, source));
    ...
}
```

Understand How the Cache Works

Implement Equals on the model

Use Collect in the pipeline

Summary

Understand the semantic model

Use the semantic model

- Check the marker attribute
- Iterate over the members of a class

Create and use a model

- Analyze the performance
- Understand how the cache works
- Implement Equals on the model

Up Next:

Packaging Your Source Generator