TRUMPF

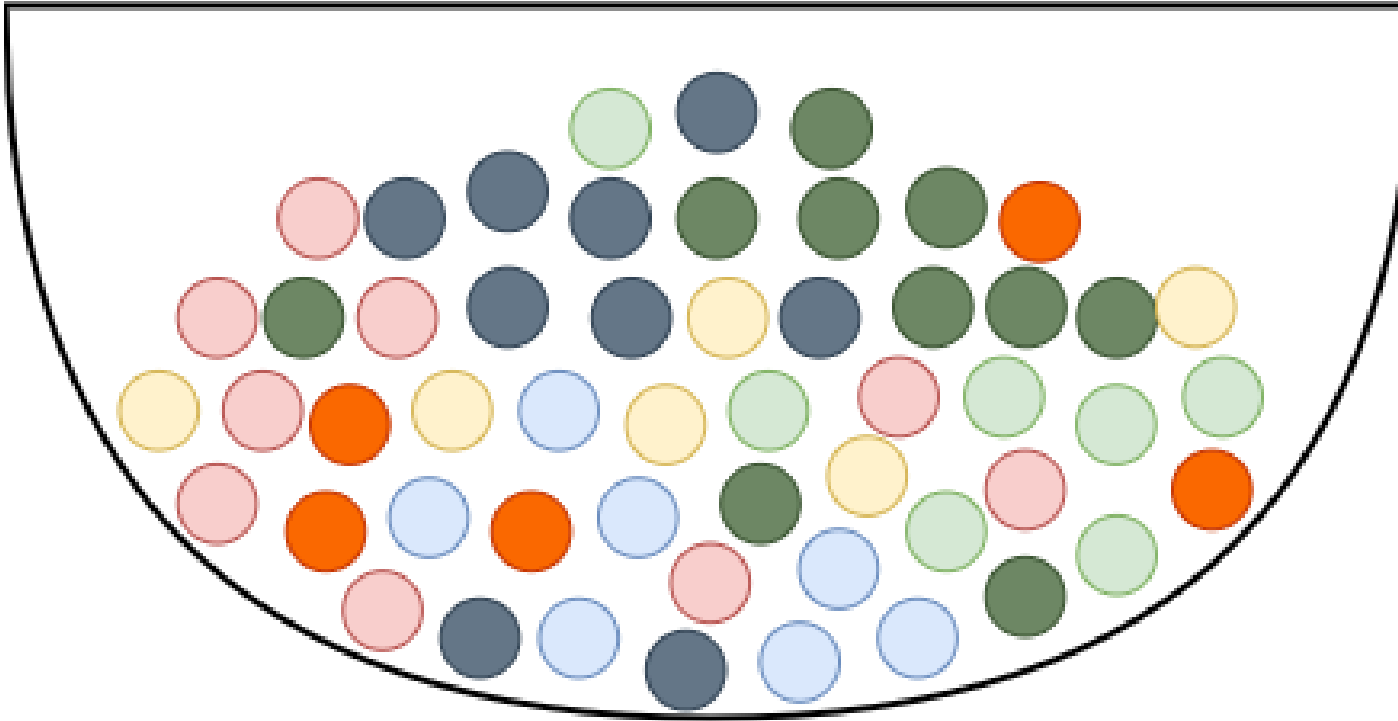# OPC UA for Devs in 10 minutes
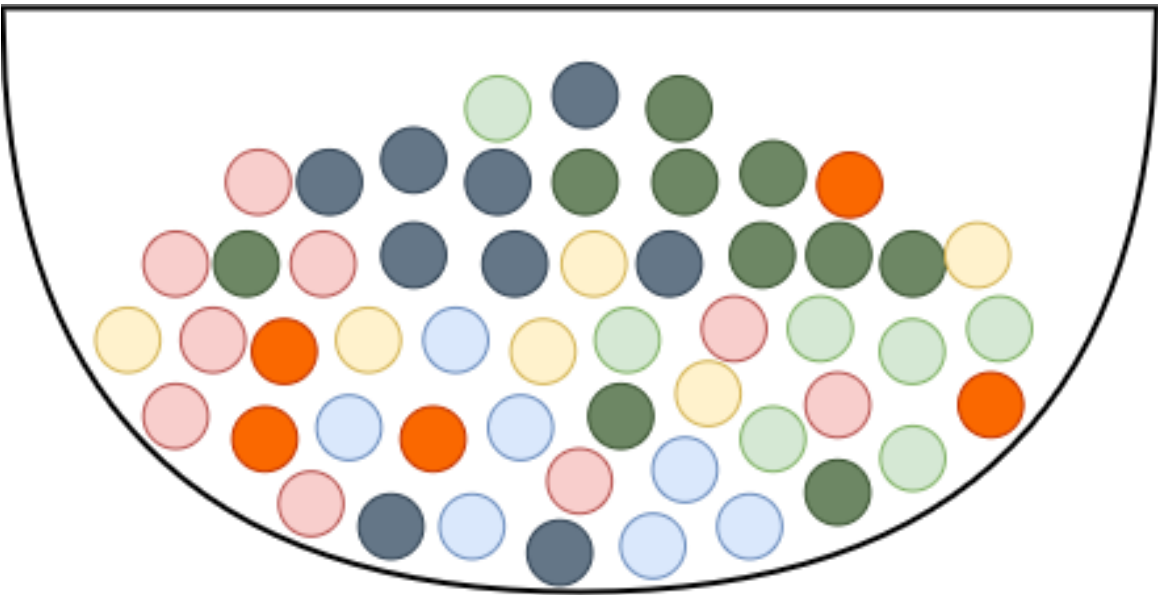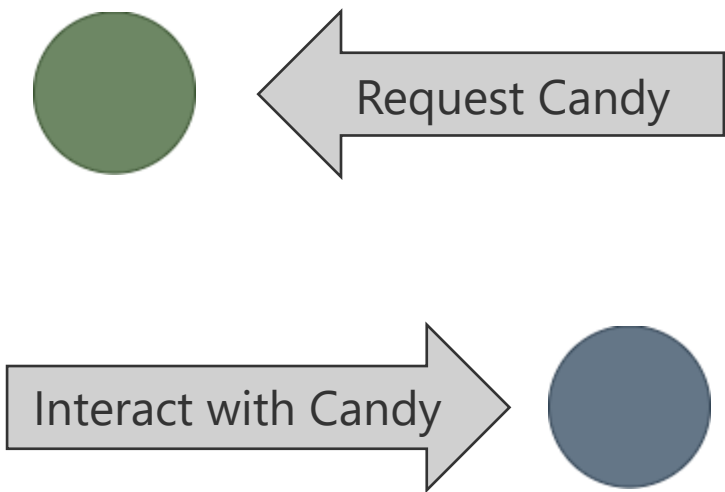
Heiko Seng

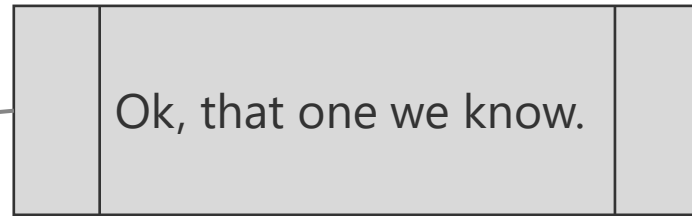# What is an OPC UA Server?

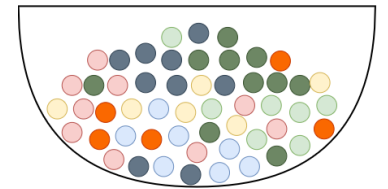**Answer**: Bowl full of different flavored candy.

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Everything is Candy

Request Candy

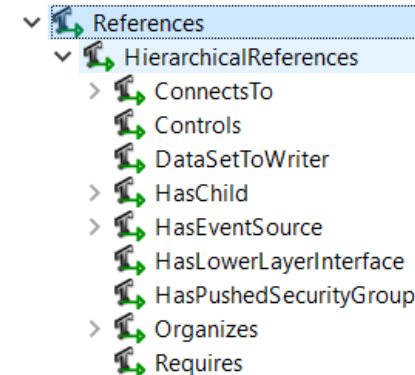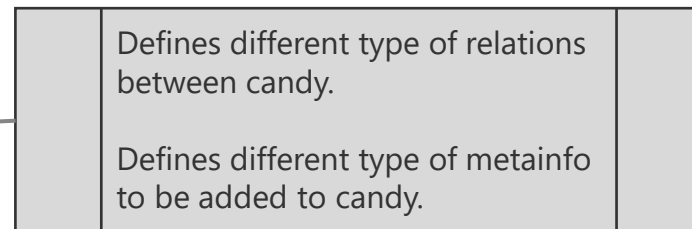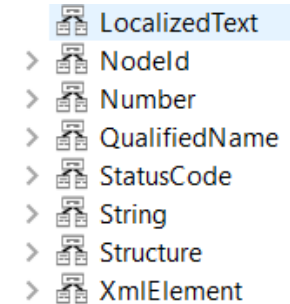Interact with Candy

Candy properties	Description
NodeId	Namespace + ID
BrowseName	Identifier when browsing
NodeClass	Candy flavor/colour

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Candy flavors 1 – basic candy

Data Type — Ok, that one we know.

Create your own Enumeration or Structure.

DataTypes
- BaseDataType
  - Boolean
  - ByteString
  - DataValue
  - DateTime
  - DiagnosticInfo
  - Enumeration
  - ExpandedNodeId
  - Guid
  - LocalizedText
  - NodeId
  - Number
  - QualifiedName
  - StatusCode
  - String
  - Structure
  - XmlElement

Reference Type — Defines different type of relations between candy.

Defines different type of metainfo to be added to candy.

References
- HierarchicalReferences
  - ConnectsTo
  - Controls
  - DataSetToWriter
  - HasChild
  - HasEventSource
  - HasLowerLayerInterface
  - HasPushedSecurityGroup
  - Organizes
  - Requires
- NonHierarchicalReferences
  - AliasFor
  - AssociatedWith
  - FromState
  - GeneratesEvent
  - HasCause
  - HasCondition
  - HasDescription
  - HasDictionaryEntry
  - HasEffect
  - HasEncoding
  - HasFalseSubState
  - HasInterface
  - HasModellingRule
  - HasReferenceMeasurementInstrument
  - HasSubStateMachine
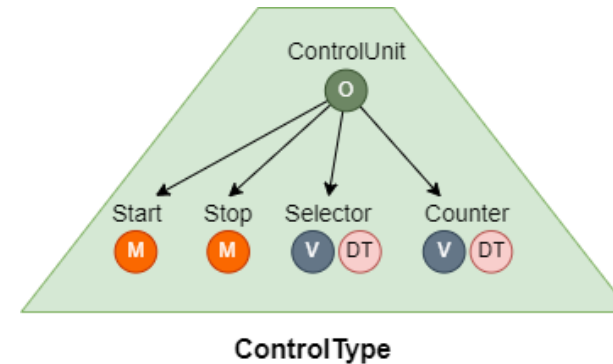 - HasTrueSubState
  - HasTypeDefinition

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Candy flavors 2 – structuring candy
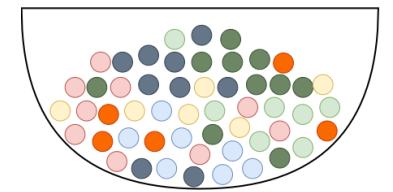
Object Type ——— Like a „Class" in Java.

Defines candy hierarchy with references.

That's the stuff defined in companion specifications.
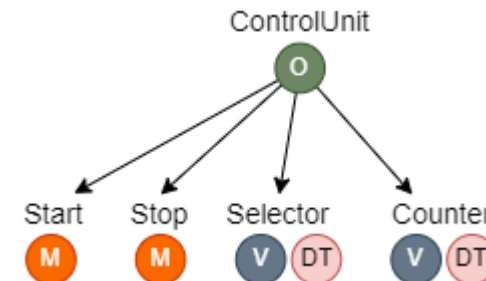*BaseObjectType for adding object without hierarchy.*

ProductionType
> ActiveProgram
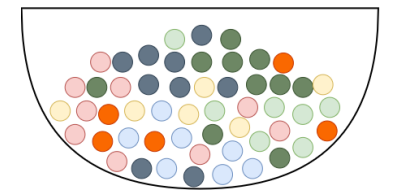> ProductionPlan
> Statistics

Object ——— Instances of ObjectType.

Element which provides hierarchy and organization in the candy bowl.

An object has no value!

BasicMachineTool
> Equipment
> Identification
> Monitoring
> Notification
> Production

Candy flavors 3 – value candy

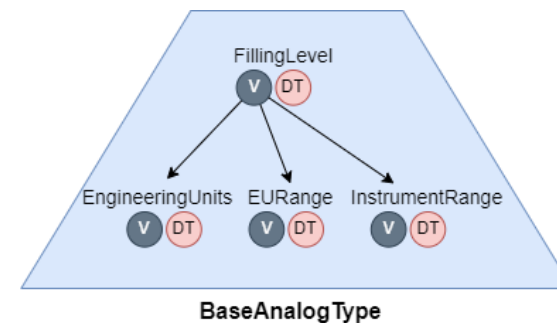The variable contains a value and has a DataType ☺

Has an additional VariableType. What??? ☹

A VariableType can define a simple variable or a variable with forced subvariables.

For simple variables the type is „PropertyType" or „BaseDataVariableType"

Candy flavors 4 – one more thing
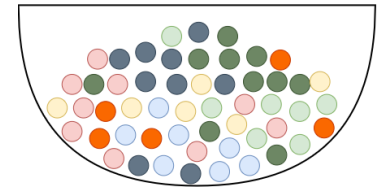
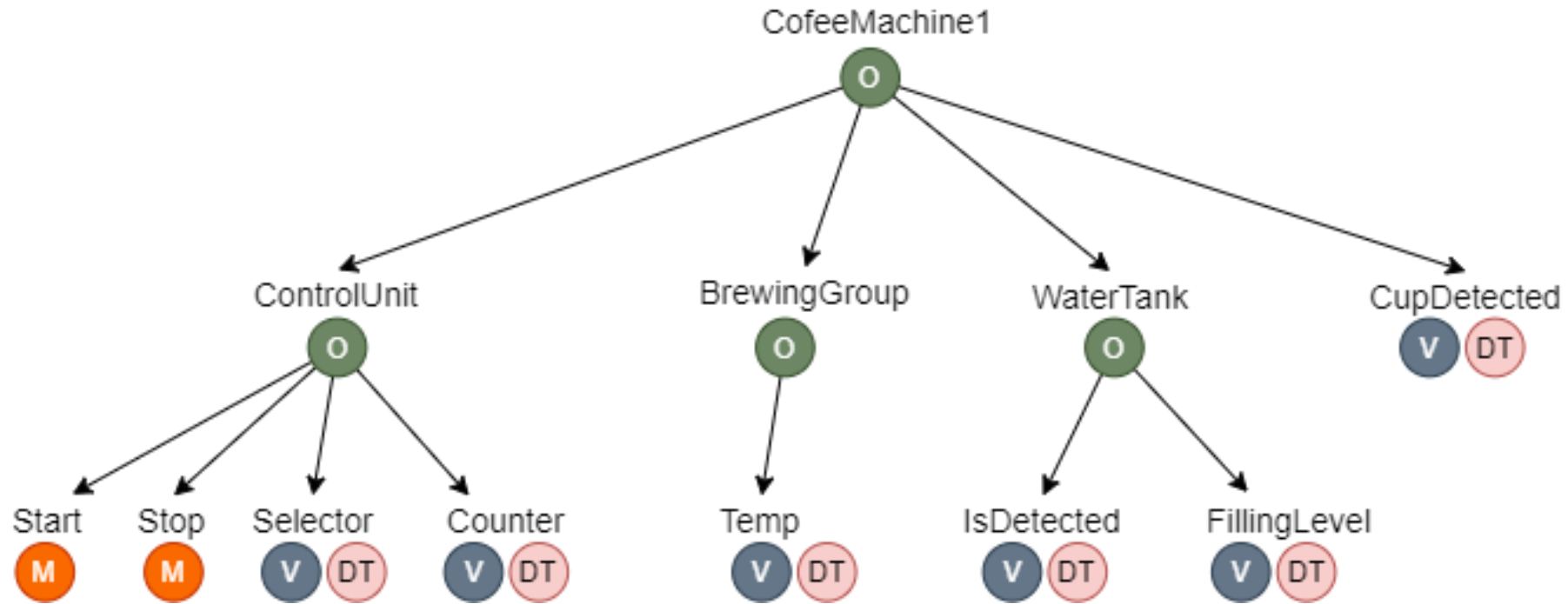| Method | We like methods.

A method can have input and output parameters with certain data types. | |

> ≡◆ GetSecurityGroup
> ≡◆ GetSecurityKeys

Yes, a method is also candy and has a nodeId.
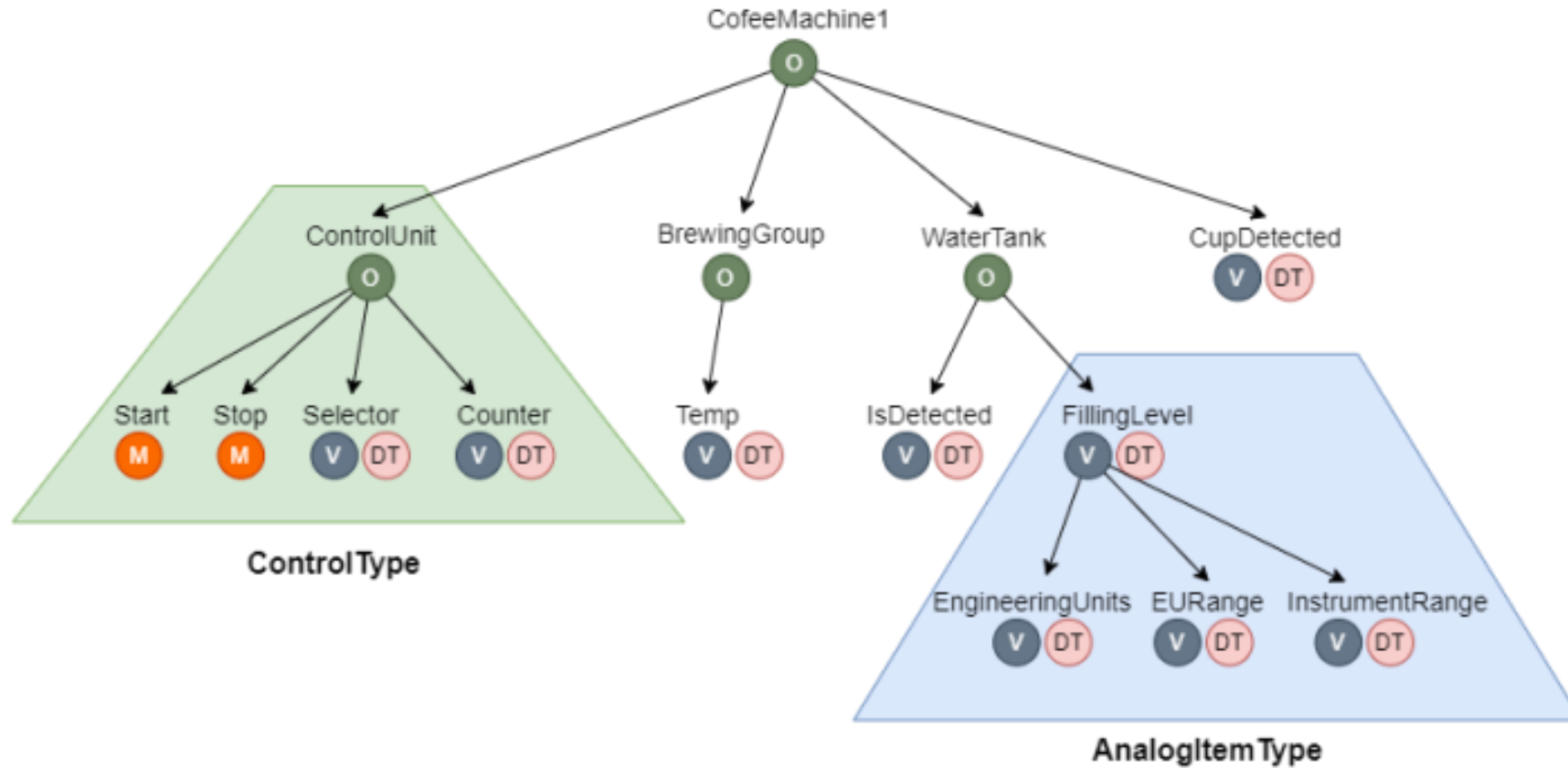
| View | Forget it. | |

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Coffee Machine

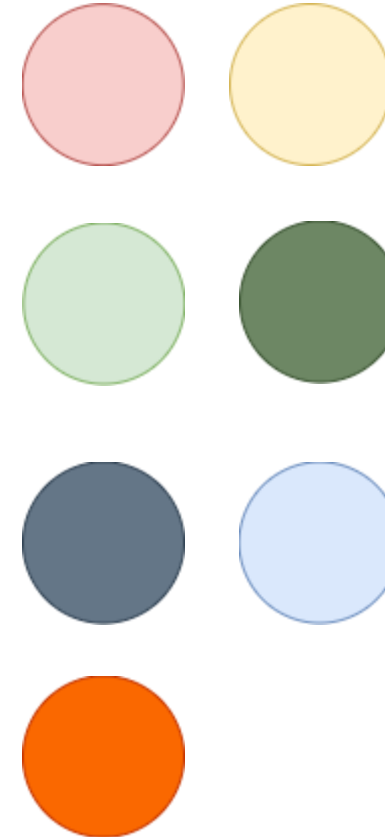TRUMPF

Coffee Machine – Object Types

Summary

An OPC UA Server is a bowl full of candy.

There are different kinds of candy with different flavor.

- **Basic candy**
  - DataTypes
  - ReferenceTypes

- **Structuring candy**
  - ObjectTypes
  - Objects

- **Value Candy**
  - Variables
  - VariableTypes

- **One more thing**
  - Methods

Candy = Node
Flavor = Node Class
Bowl = Adress Space

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