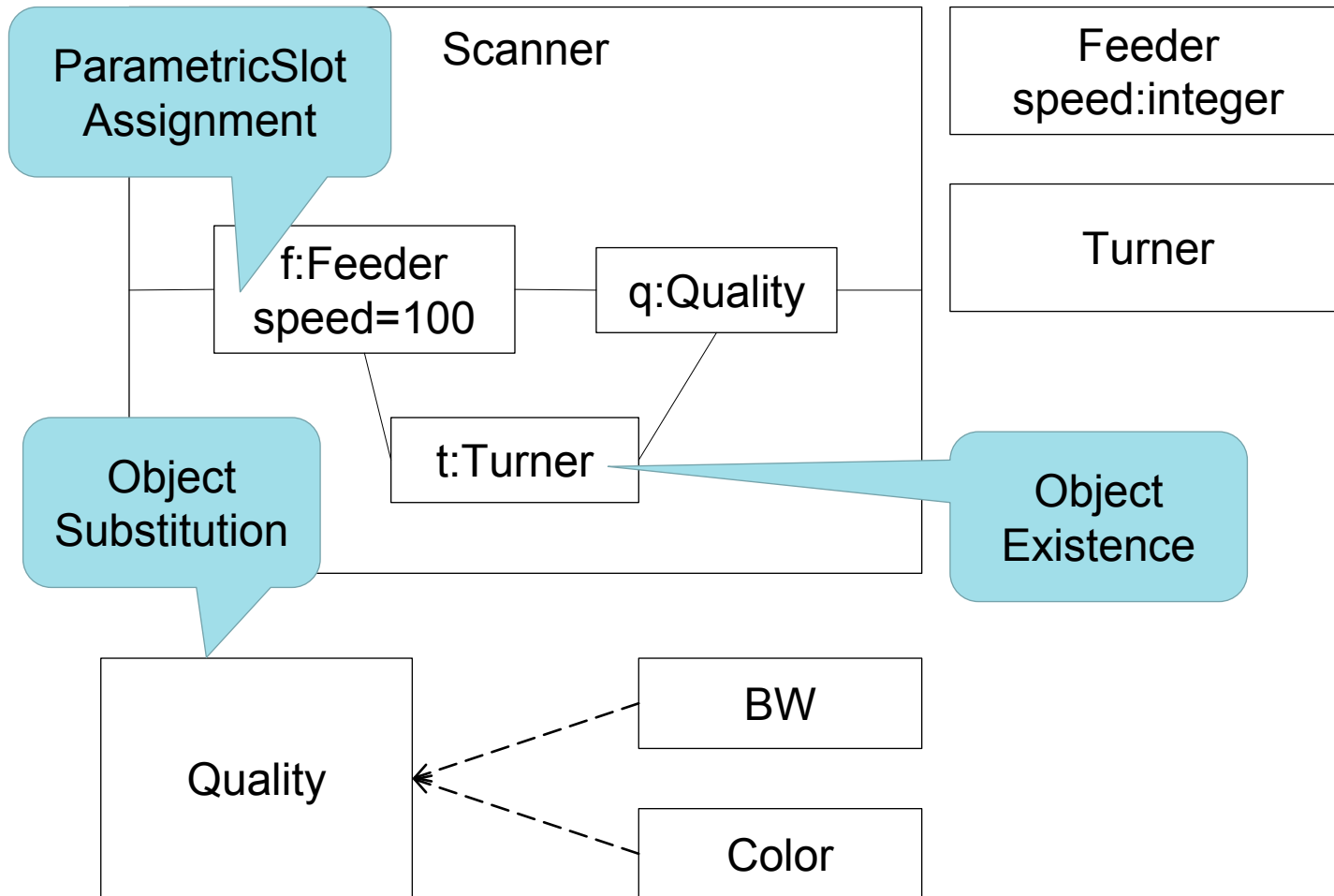


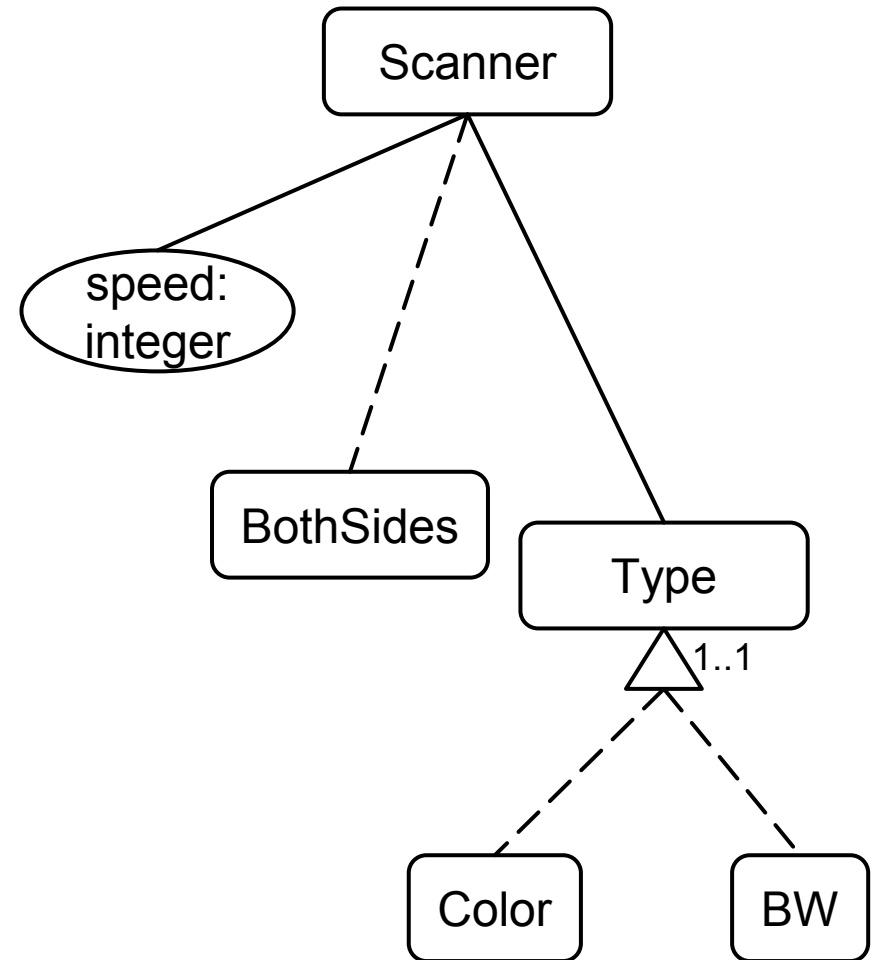
CVL Tutorial

Details of Realization

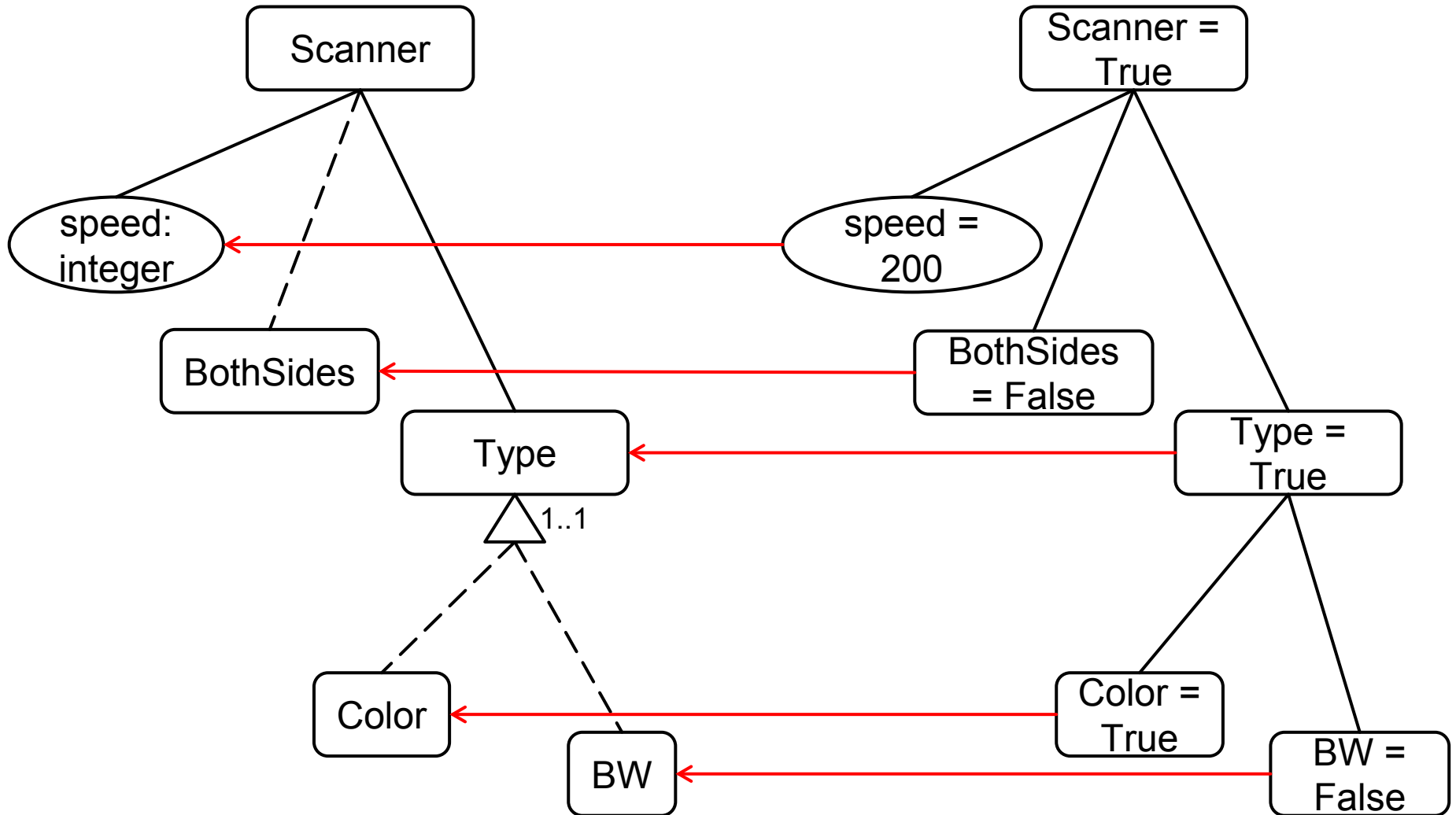
The Base Model of the Scanner



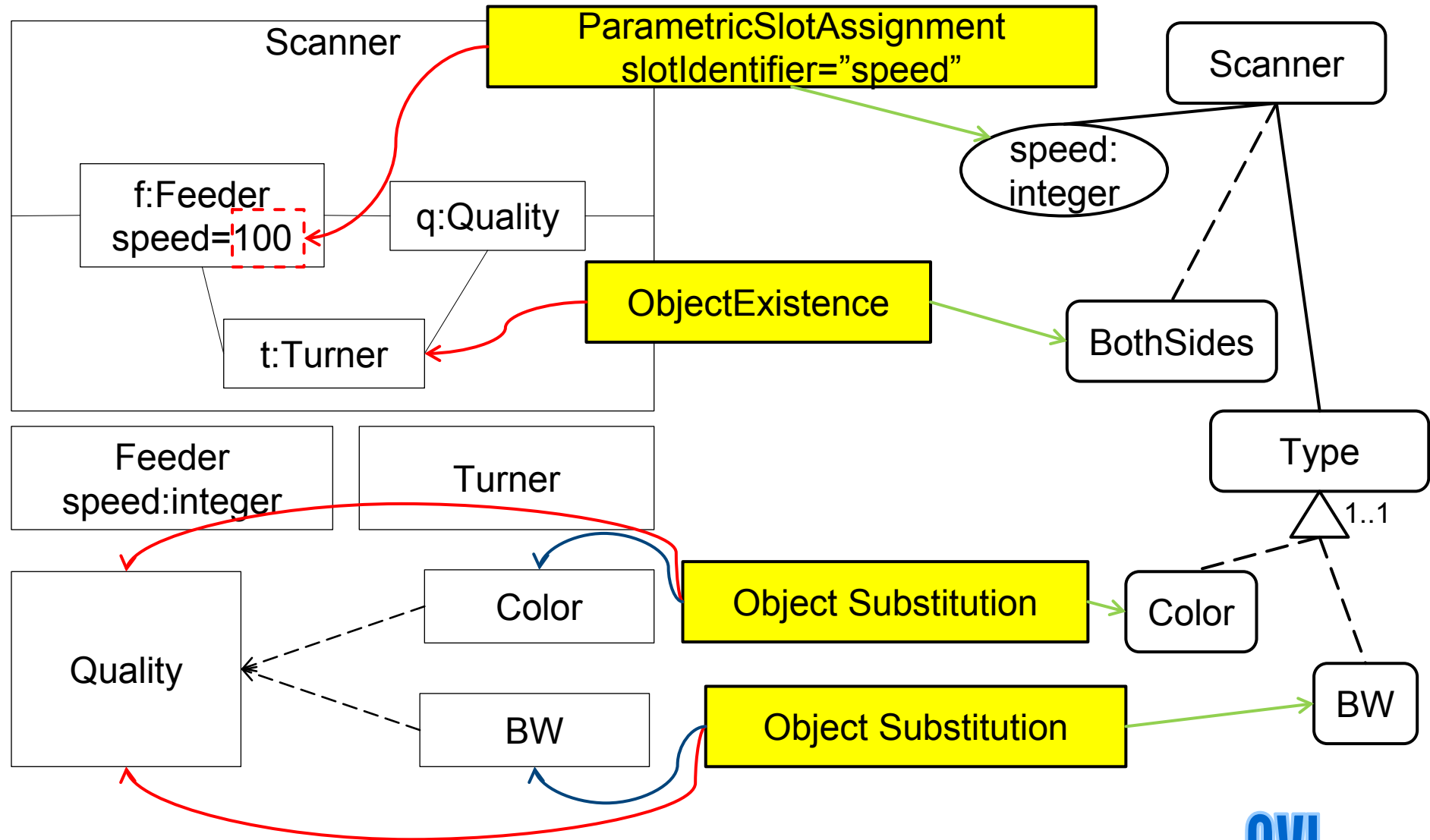
The VSpec layer of the Scanner



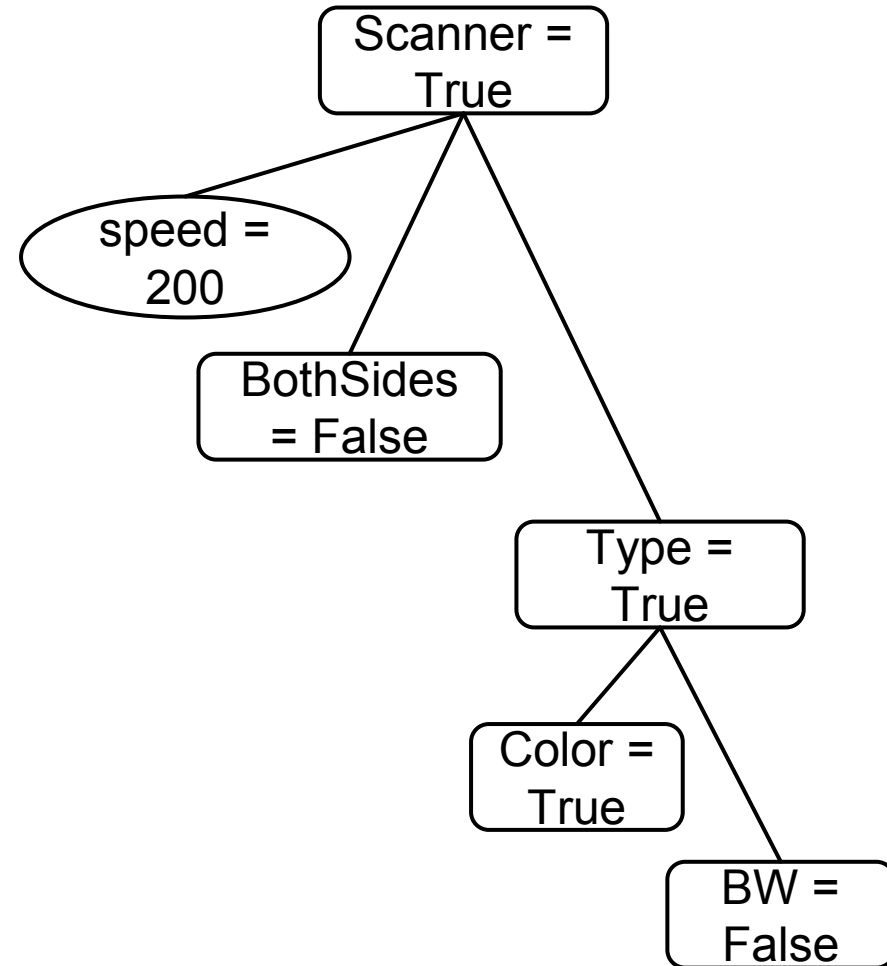
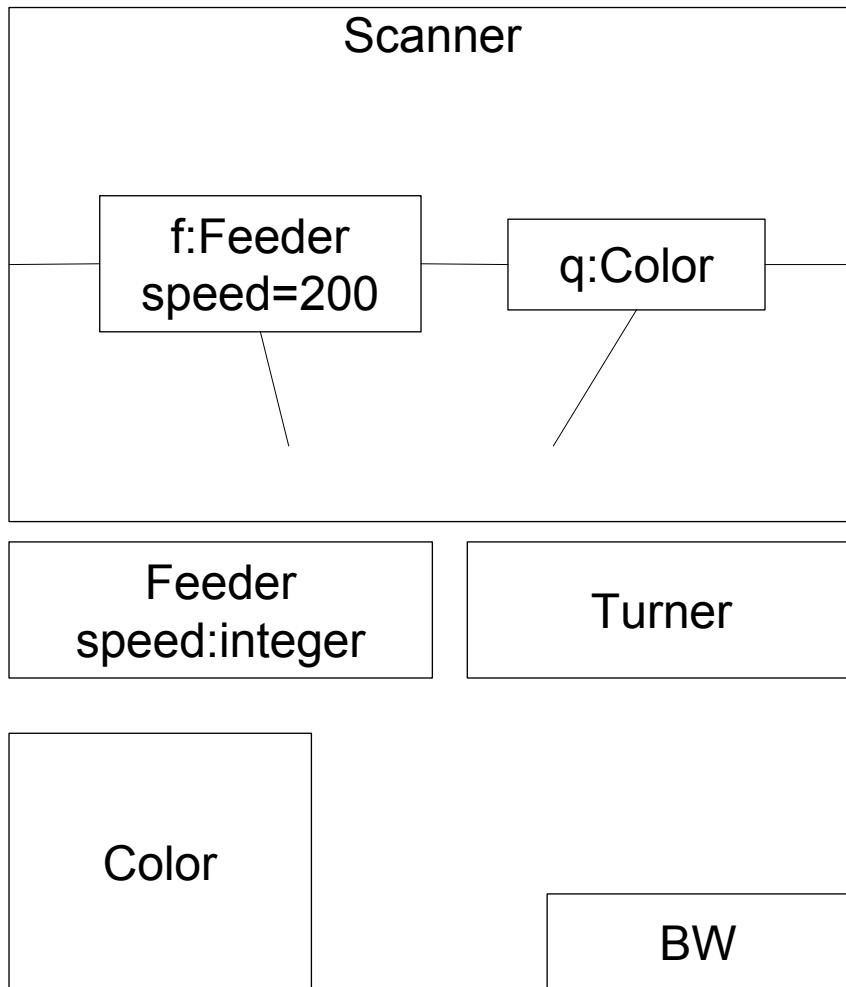
One resolution of the Scanner



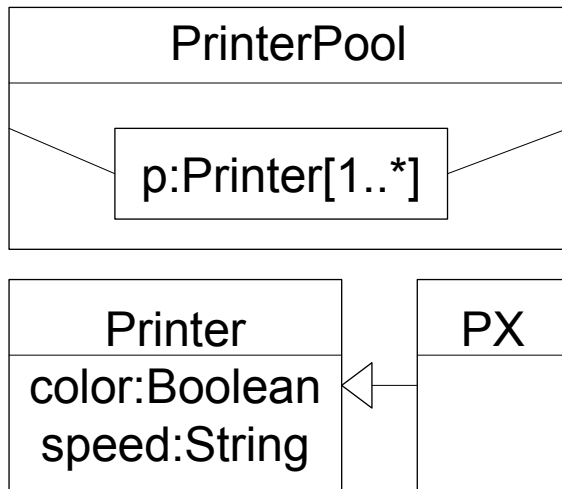
Realization Layer of the Scanner (Object)



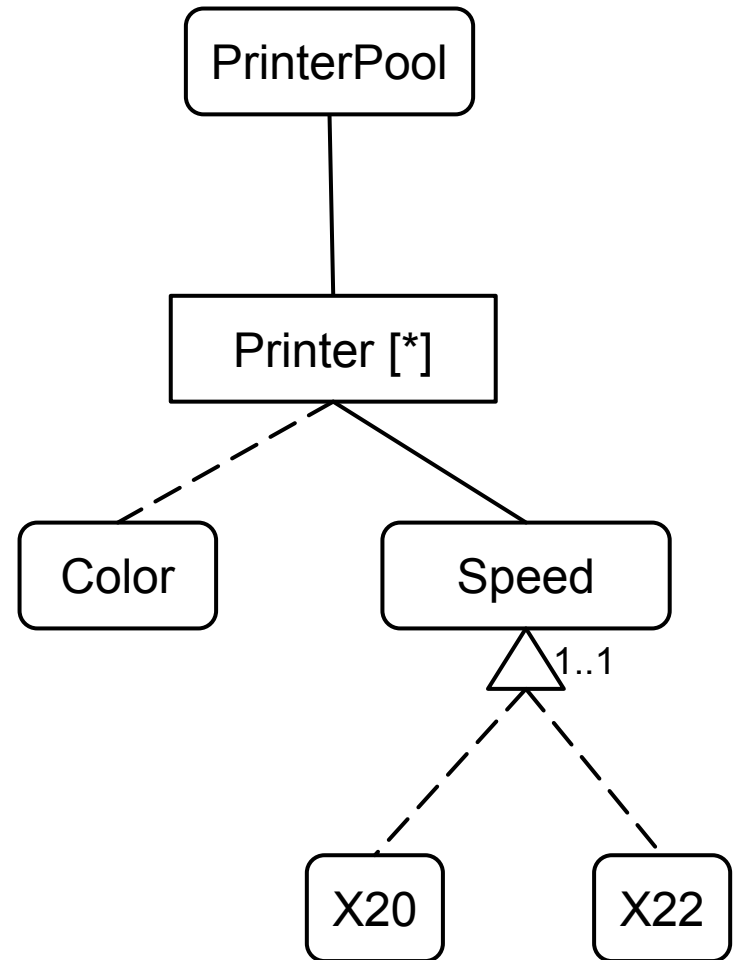
The resulting product of the Scanner



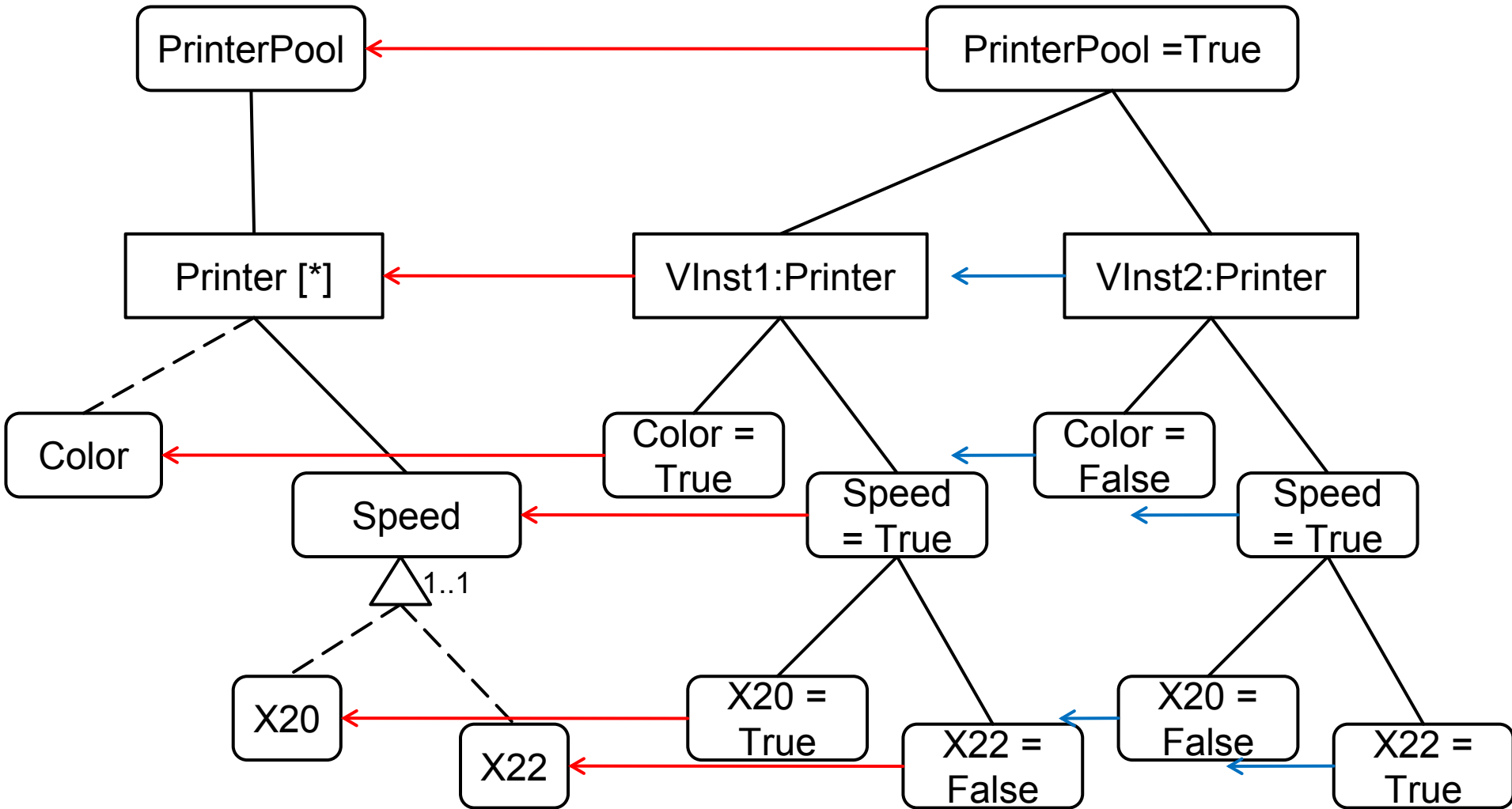
The base model of the PrinterPool



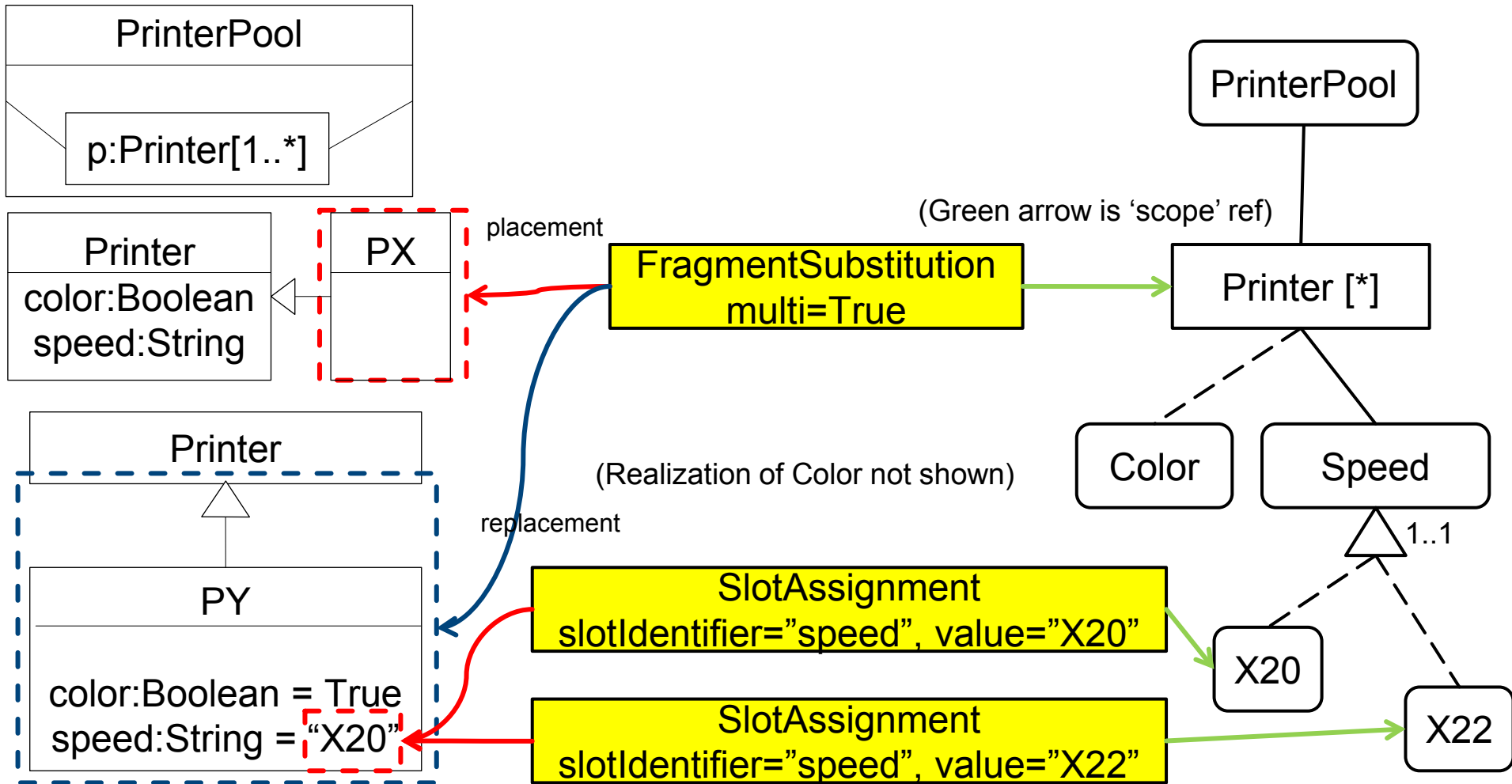
The VSpec layer of the PrinterPool



One resolution of PrinterPool

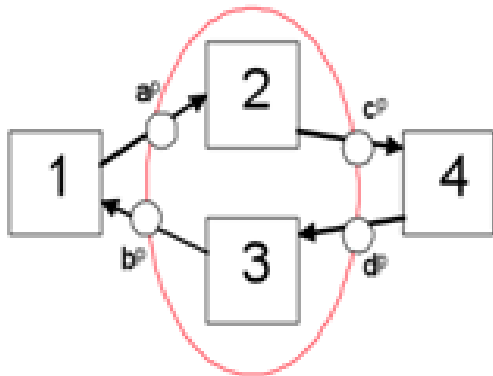


Realization Layer of the PrinterPool

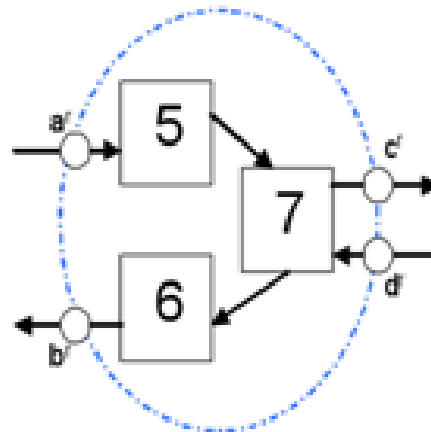


Achieving generality: The Fragment

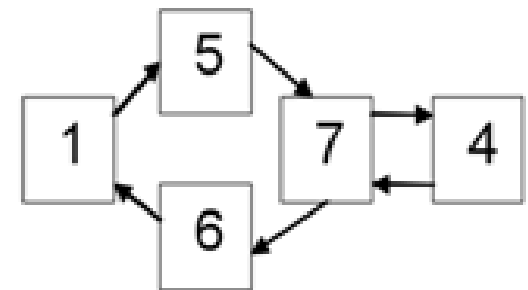
- CVL has two layers: abstraction layer and realization layer
- Substitution is the key concept of realization layer
- The fragments are on the model instances and they are all defined by MOF



Base model plus Placement Fragment

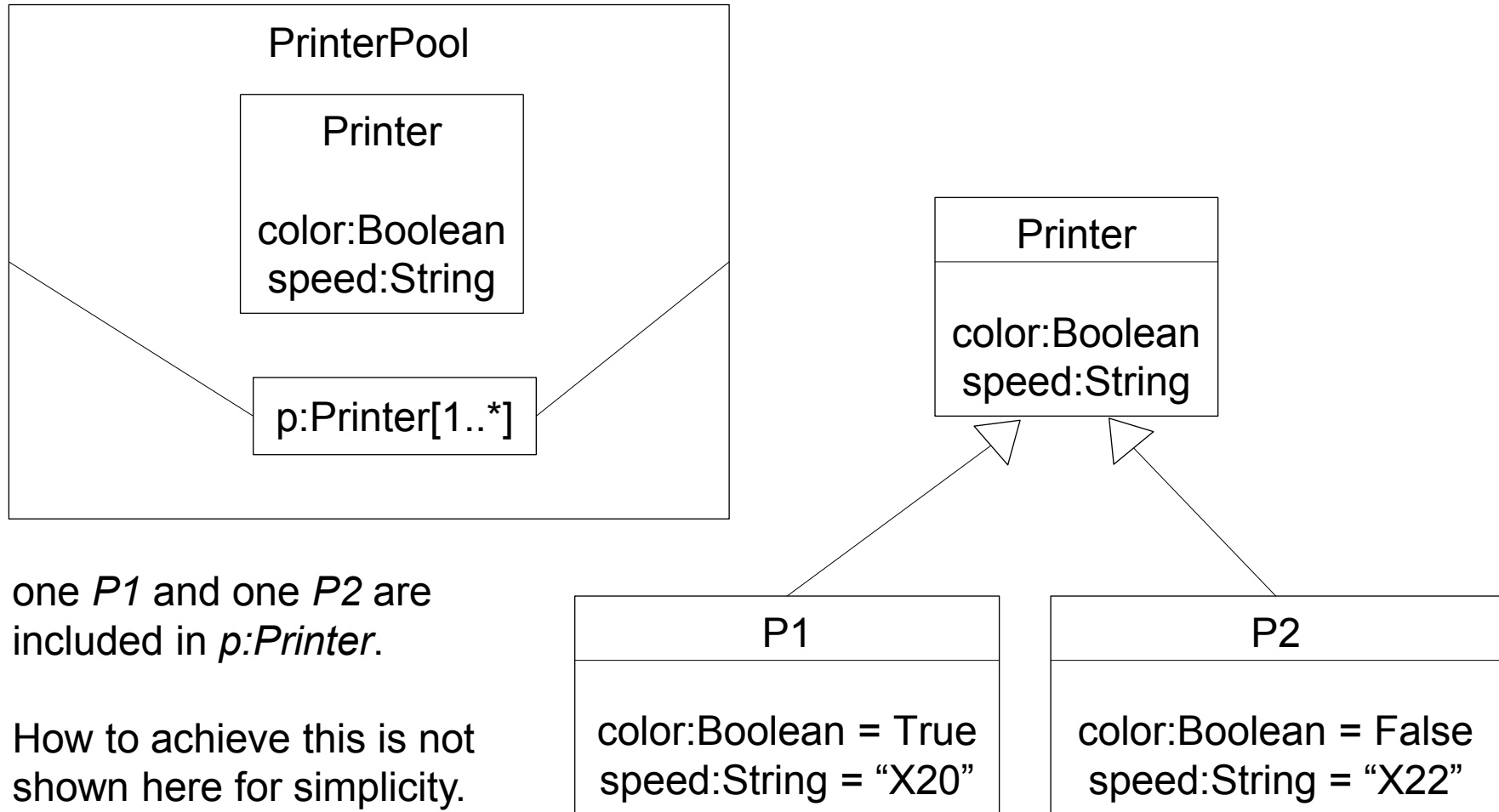


Replacement Fragment



Resolved product model

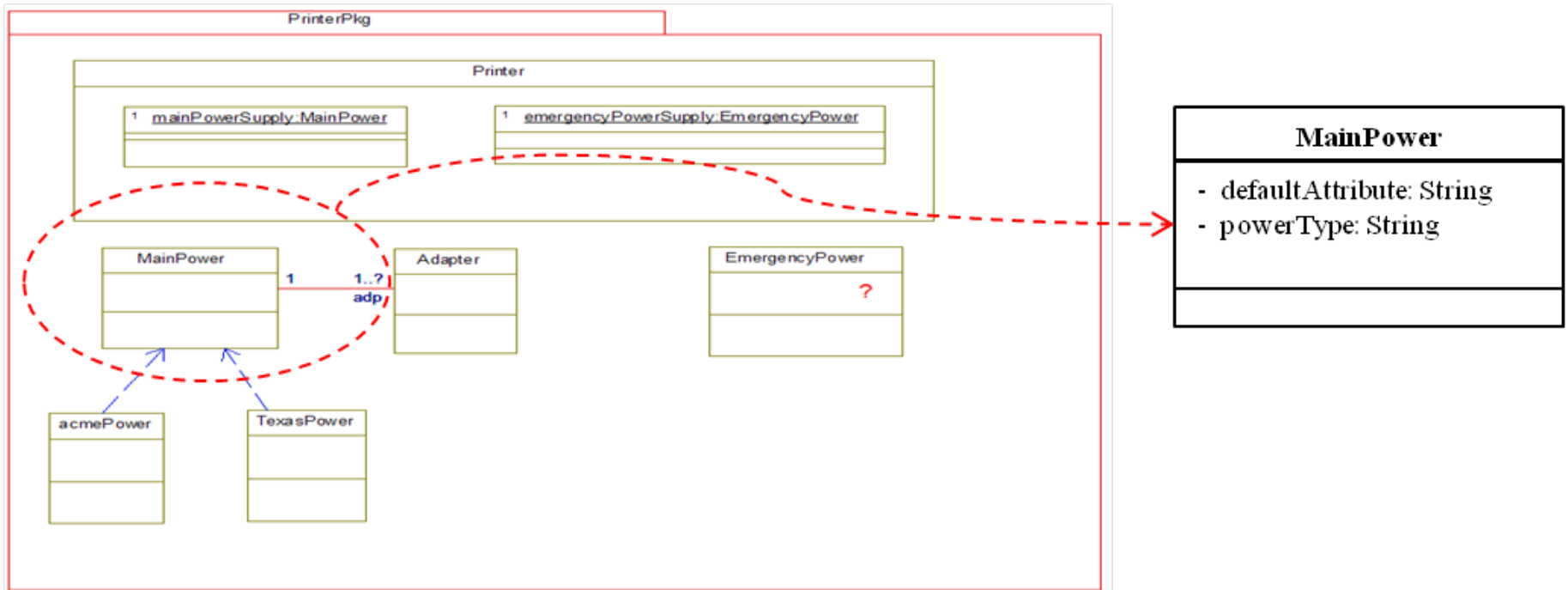
Resulting Product model of PrinterPool



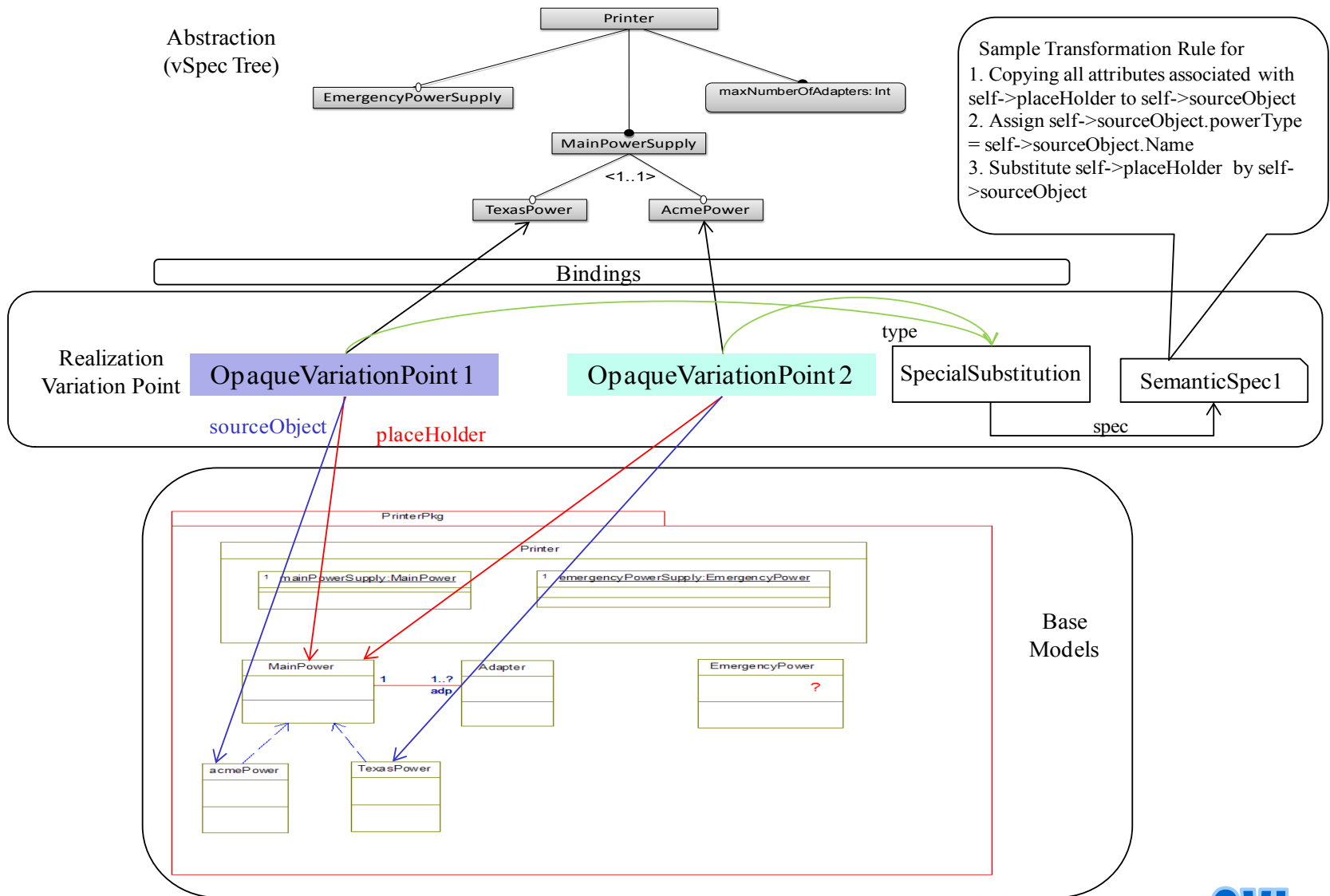
Semantics of Fragment substitution

- Simple fragment substitution when multi=False
 - Delete the placement
 - Make a copy of the replacement
 - Bind the replacement copy to the hole of the placement
 - The boundary points must correspond
- Multiple fragment substitution when multi=True
 - Delete the placement
 - Make a number of copies of the replacement
 - the actual number of copies is given by the resolution model resolving the VSpec that refers the given FragmentSubstitution
 - Bind all the copies to the hole of the placement
 - All references into the placement must have multiplicity more than one

Opaque Variation Point (1/2)



Opaque Variation Point (2/2)



Sample Transformation Rule for

1. Copying all attributes associated with self->placeholder to self->sourceObject
2. Assign self->sourceObject.powerType = self->sourceObject.Name
3. Substitute self->placeholder by self->sourceObject