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OMG Deployment and Configuration of Distributed Component-Based Applications

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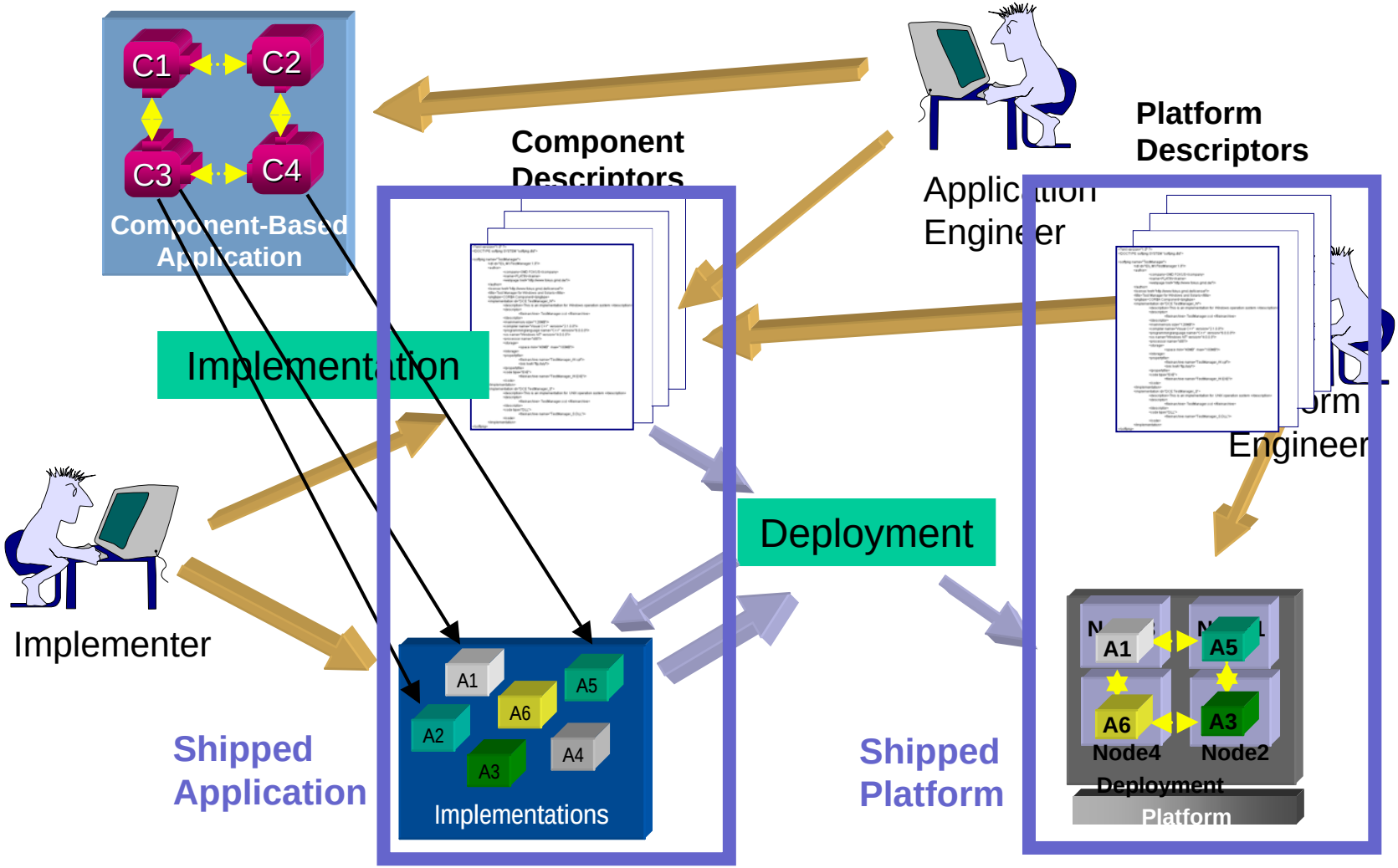
Submitters and Supporters

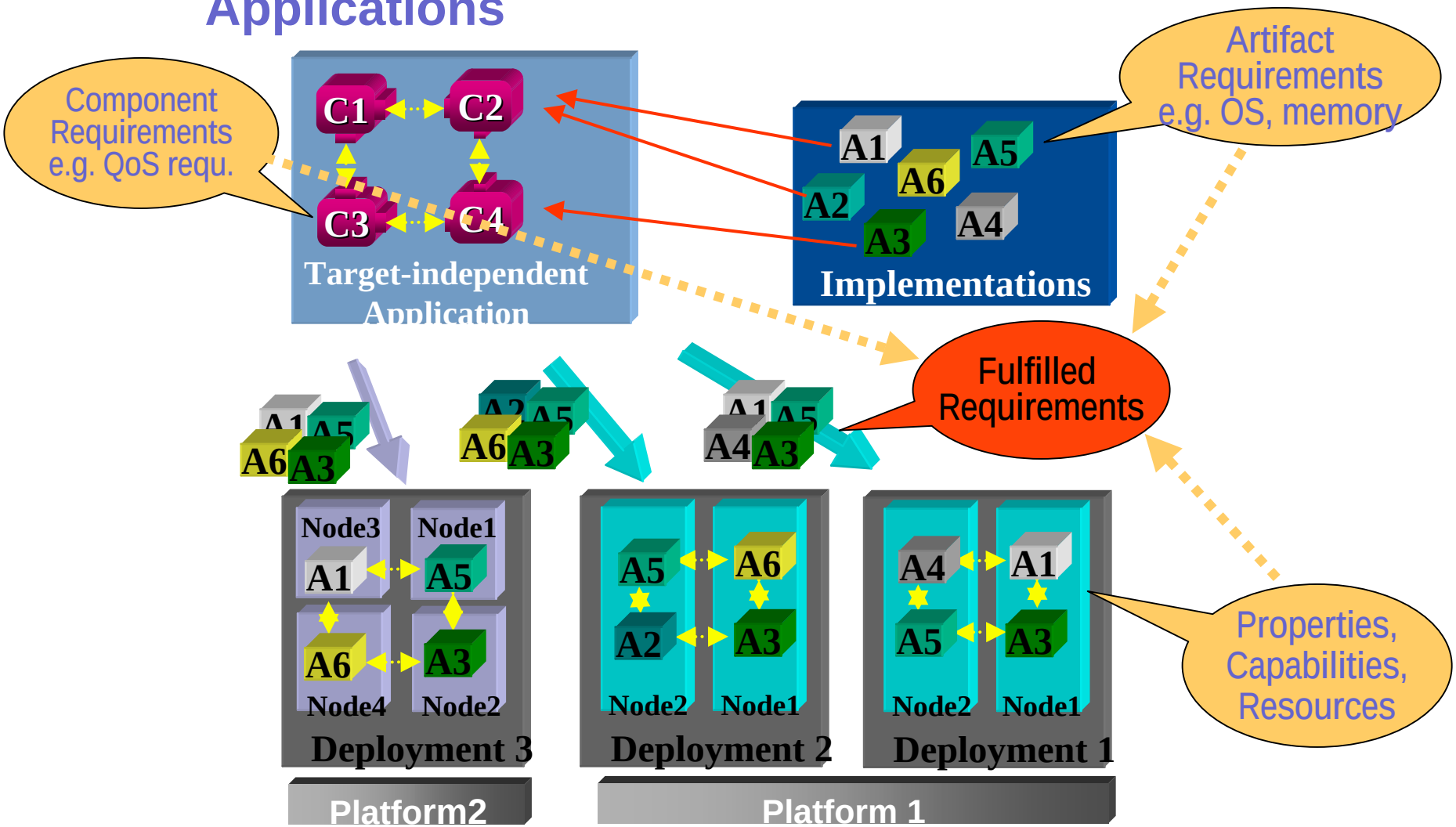
- Submitters
  - Fraunhofer GMD FOKUS
  - Mercury Computer Systems
  - Rockwell Collins
- Supporters
  - Carleton University
  - Raytheon Company
  - MITRE Corporation
  - BAE Systems
  - 88solutions Corporation
  - Deutsche Telekom
  - France Telekom
  - Humboldt Universität Berlin

Context: Component-Based Development

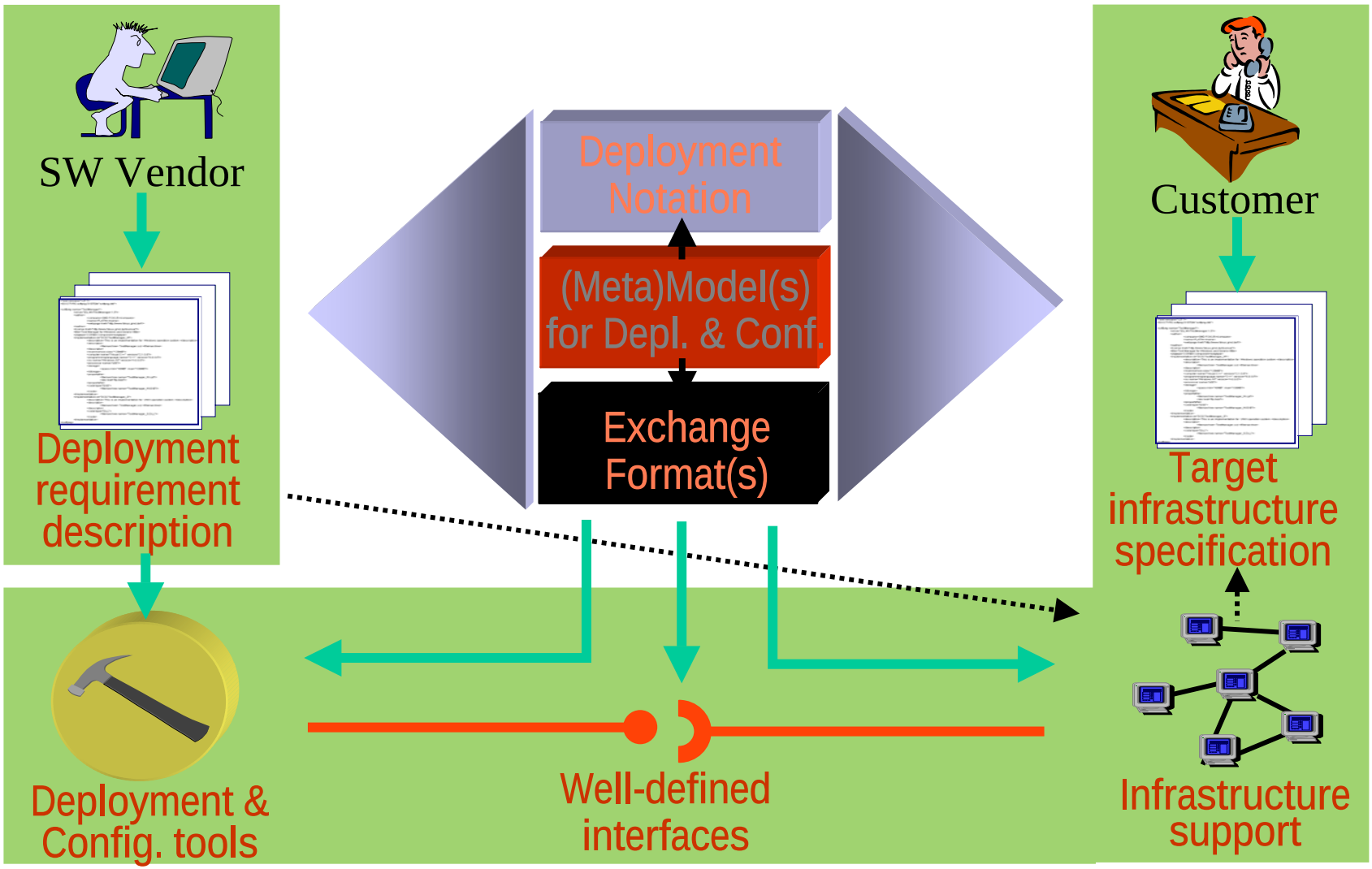
Component-Based Development



Problem: Component-Based Distributed Applications

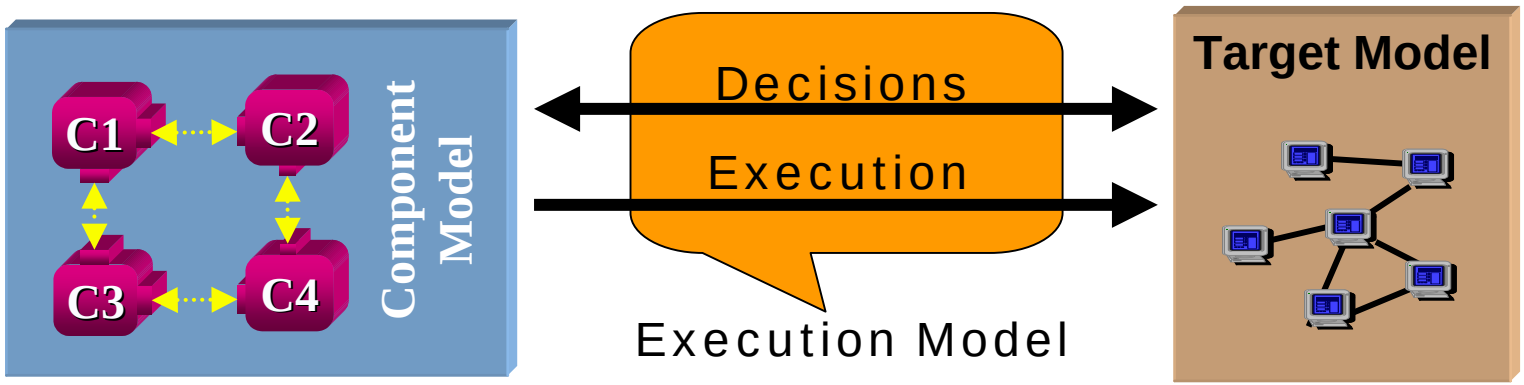


What's Needed for efficient (automated) Deployment & Configuration?



Deployment and Configuration Specification

Models Overview



- Don’t be too specific about tools but define models so that tools (from different vendors) can interoperate
  - Component Model describes logical view
  - Target Model for runtime environment
  - Execution Model records deployment decisions

Key Principles

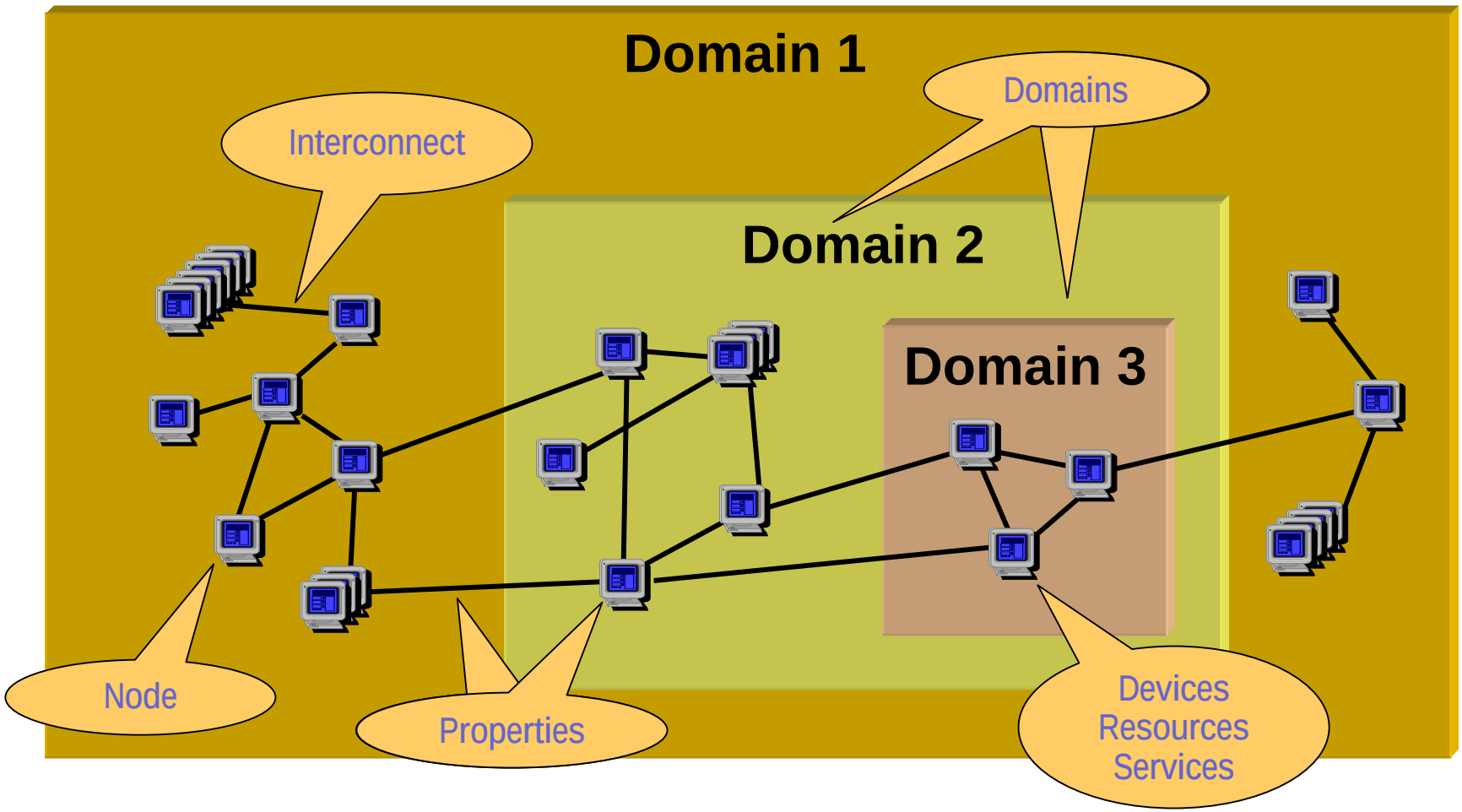
- Submission conforms to MDA
  - PIM defining general concepts for Deployment & Configuration
  - PIM can be transformed to different component platforms (e.g. CORBA, EJB, .Net)
  - CORBA-PSM specializing the PIM for CCM
  - PSM for SCA
- Clear separation between
  - Logical component view and physical deployment view
  - Description of components and the target infrastructure
- Submission compatible with existing OMG standards
  - MOF
  - Proposed UML 2.0 submissions
  - CCM

Platform Independent Model (PIM)

- Component concepts
  - Application view: Top-level components as applications
  - Component view: Decomposition of components
  - Implementation view: Artifacts & constraints
- Infrastructure concepts
  - Target view: Domains & nodes & resources
    => Topology of target infrastructure
- Deployment concepts
  - Deployment of Artifacts onto target infrastructure
  - Properties and deployment requirements

- Separate deployment package that refines UML 2.0 concepts

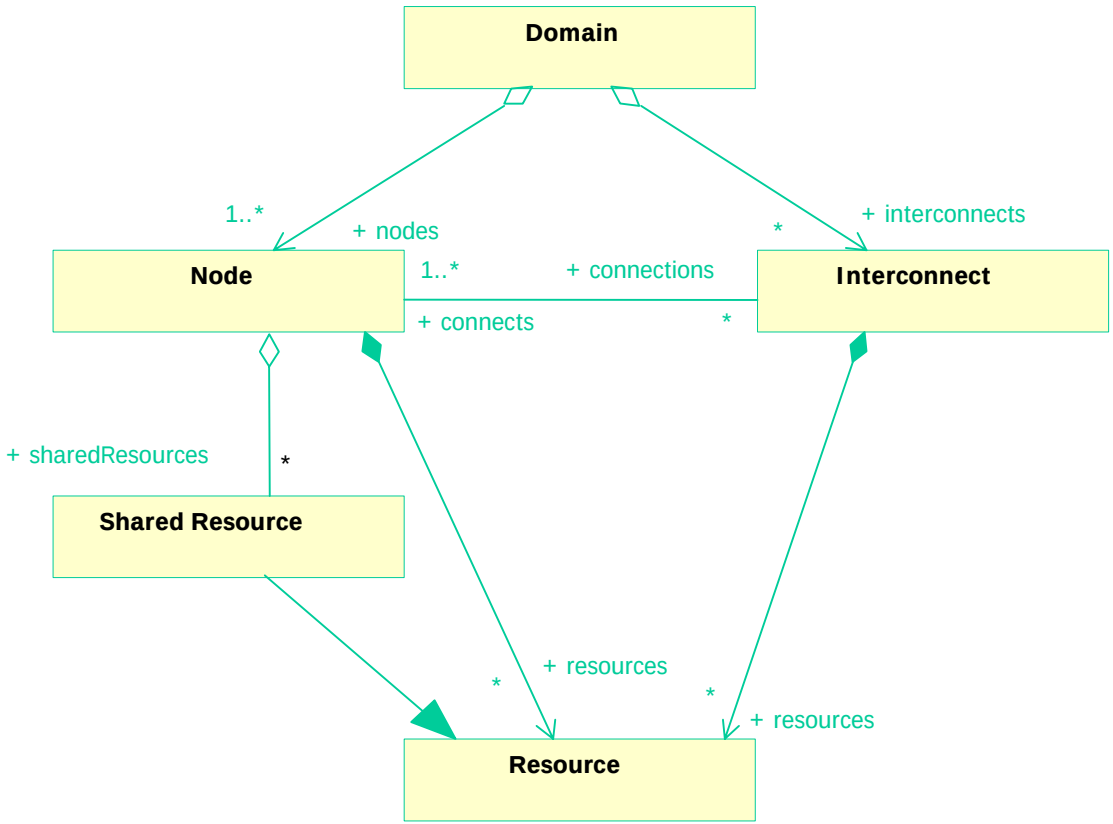
PIM: Infrastructure: Target View



Target Model Rationale

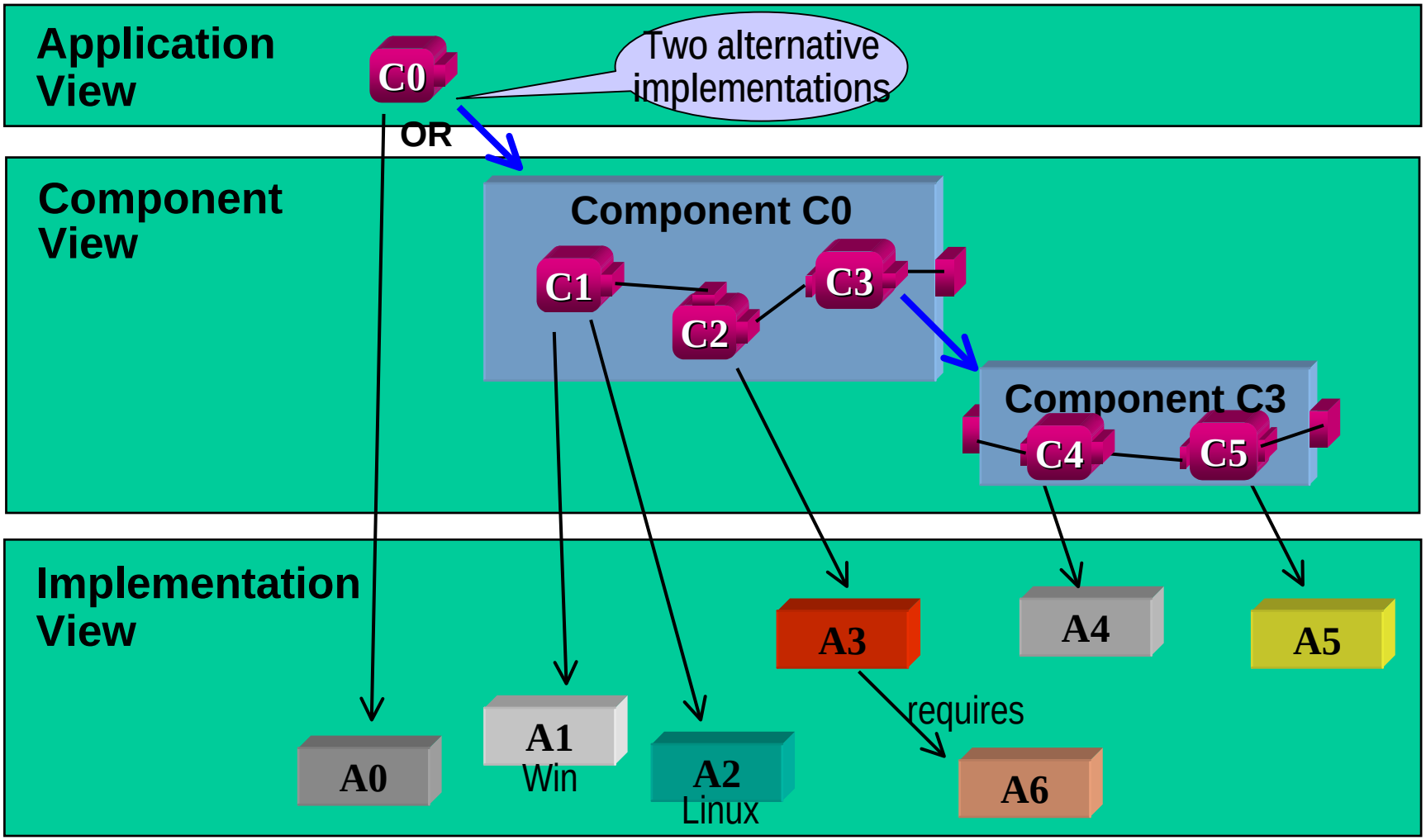
- Nodes have computational capabilities
  - They are a target for execution
  - Accommodate GPPs, DSPs, FPGAs
- Nodes have resources (e.g. hardware devices)
- Resources may be shared
- Nodes have access to Interconnects
- Sum of Nodes and Interconnects is the Domain

PIM: Infrastructure: Target Model



- Node, Interconnect and Resource have properties
  - These properties are matched against artifact properties

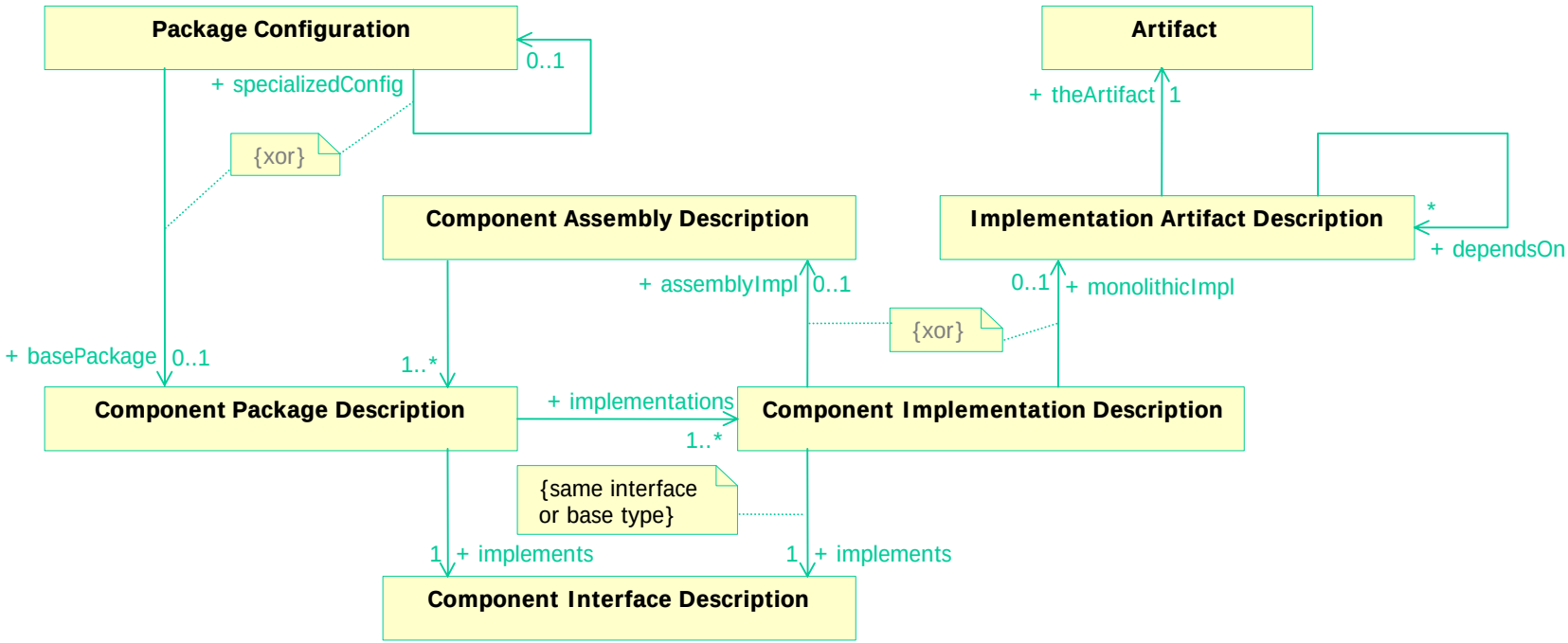
PIM: Infrastructure: Component View



Component Model Rationale

- Implementation View Level:
  - Describes implementation-specific properties (e.g. required hardware devices)
- Component View Level:
  - Allows implementations to be monolithic or assembly based
- Application View Level:
  - Bundles up multiple implementations into “packages”
  - Provides means to configure application

PIM: Infrastructure: Component Model



- Recursion on Packages
  - Easy reuse of packages
  - Easy update (e.g. via URL)
- Capture an Artifact's dependencies (libraries, support files, …)

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Thank You.