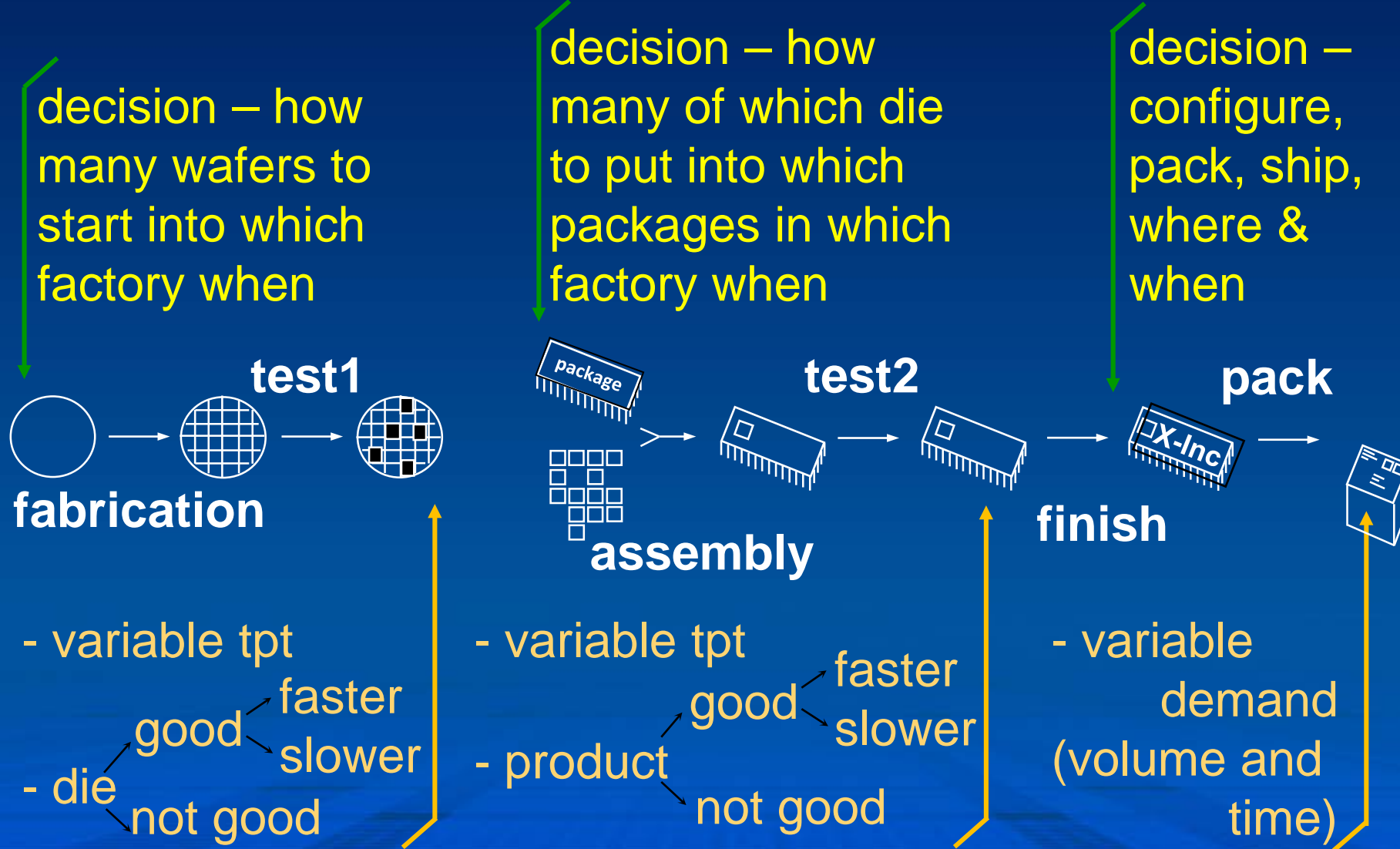




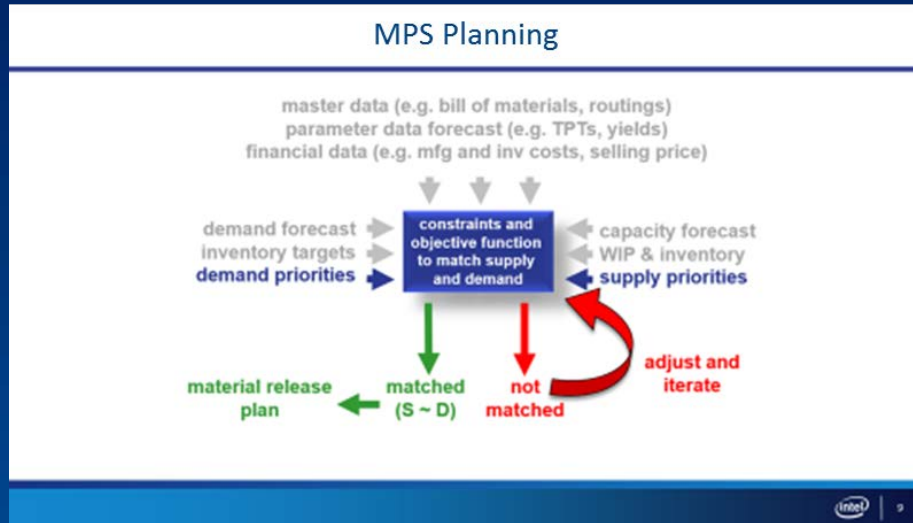
Modeling the Supply Chain using Anylogic Simulation and MILP optimization

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Supply Chain Strategy & Analytics
April 2018

Semiconductor Supply Network



Planning Testbed Environment



Inventory Targets

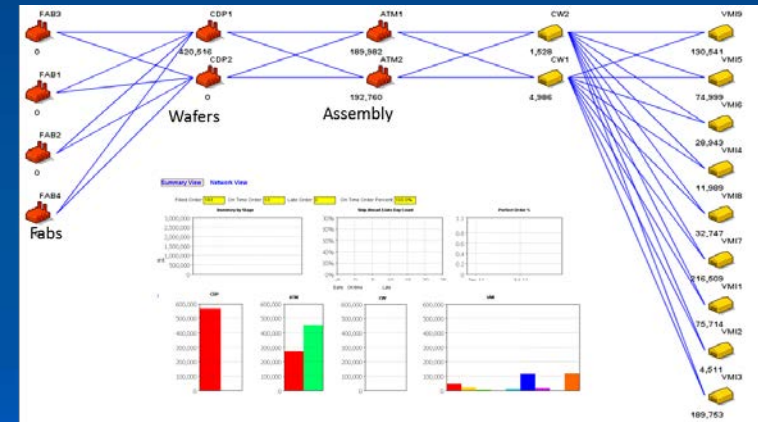
- Inventory Policies – could be:
- Heuristics
 - Statistical
 - Dynamic Models

New State of world based on execution of plan and inventory policy forward in time

Planning systems simulation

- MILP solvers find best answer given the current state of the world
- Simulates actual production solvers

New Plan based on current state of world

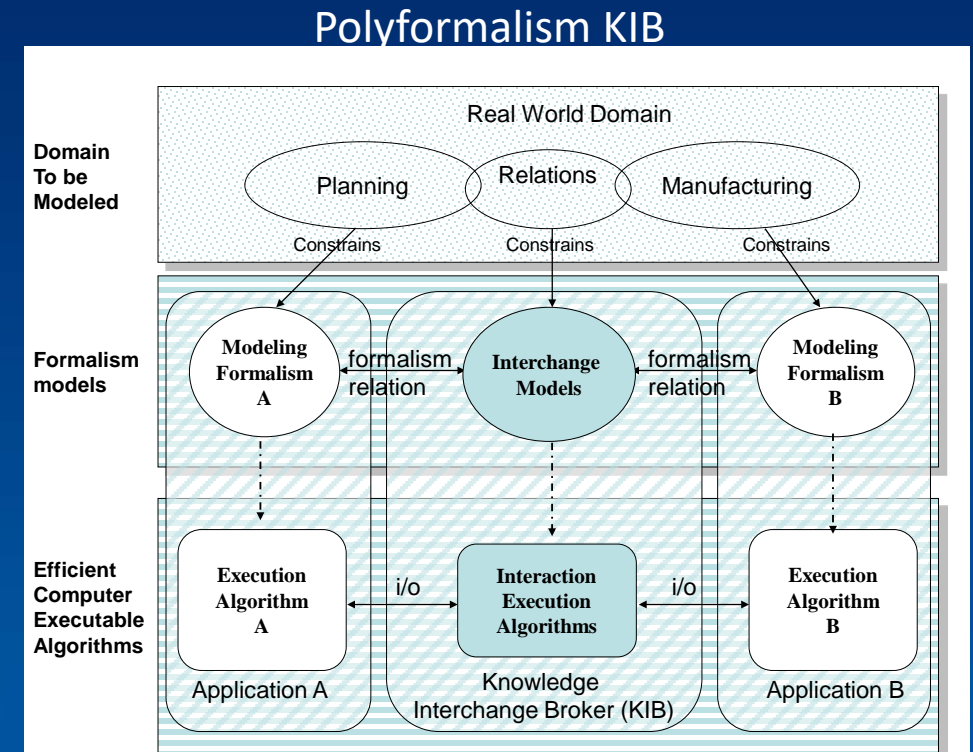
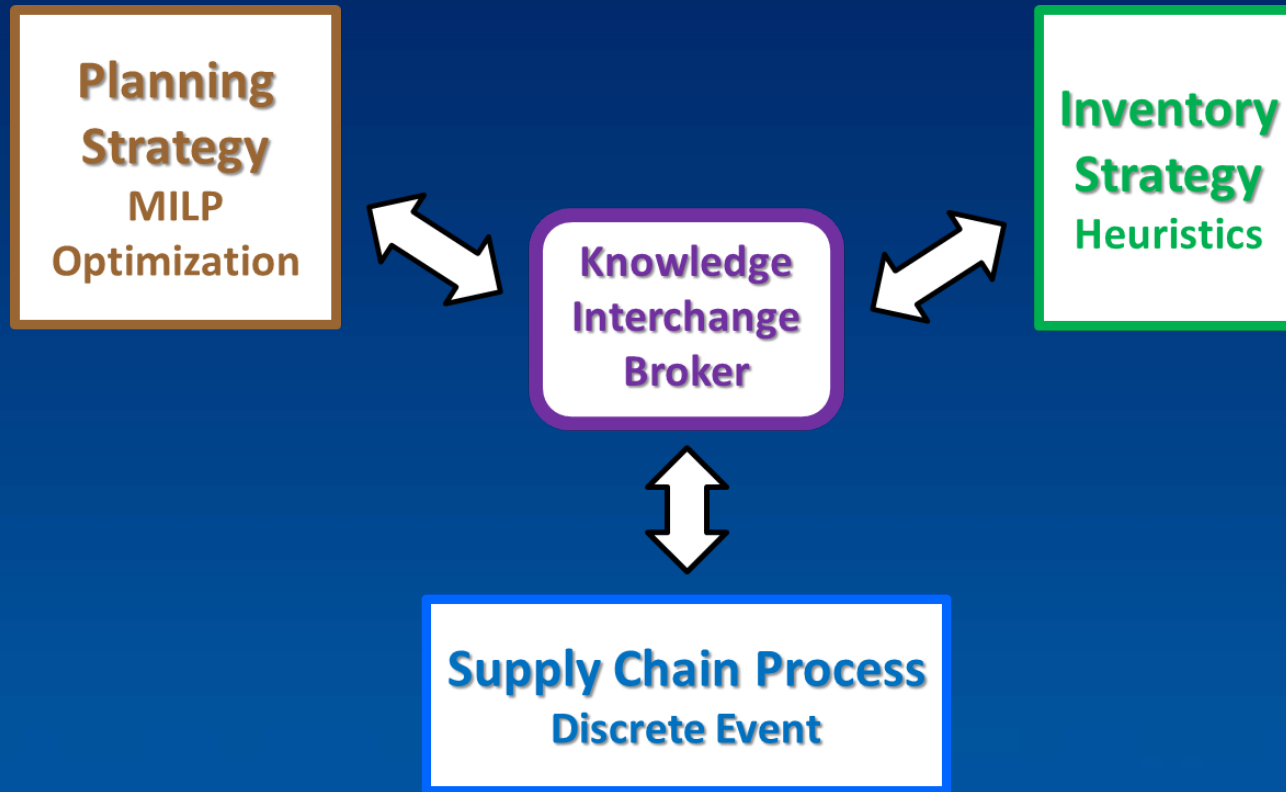


Physical network simulation

- Discrete Simulation to play forward dynamics in time
- Metrics collected on performance of planning policies



End-to-End Simulation Poly Formalism Modeling

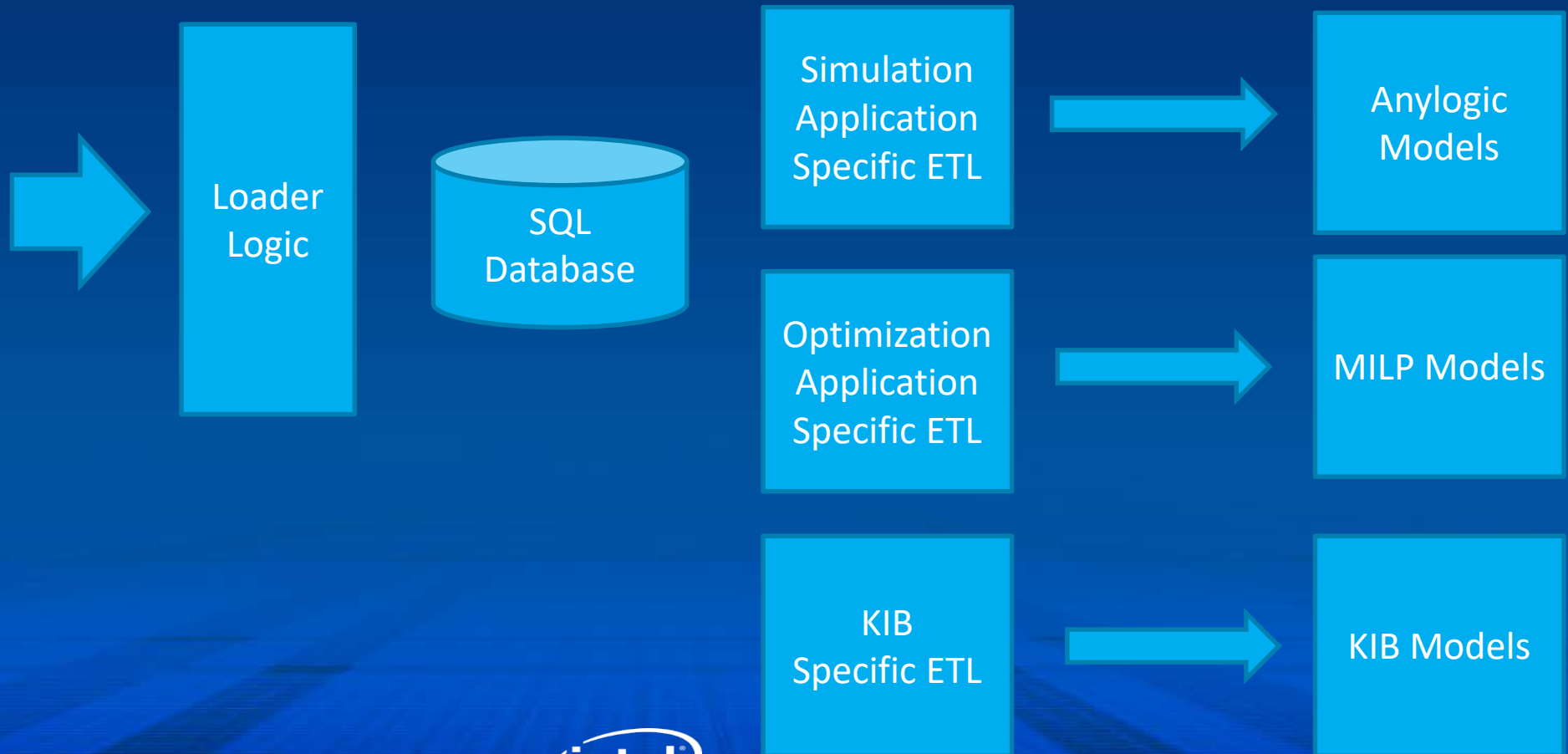


- KIB enables modeling to match the semantics between the models
 - Data transformations
 - Control flow
- Interoperability is one time development effort between the applications



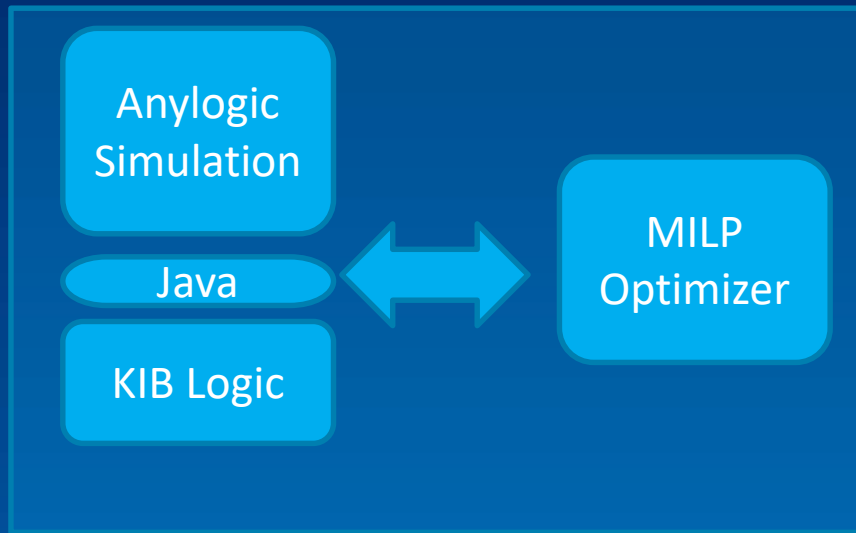
Database Generated Models

- Worldwide physical facilities
- Products
- Lead times
- Capacities
- Valid product routings
- BOMs



Run Time Implementations

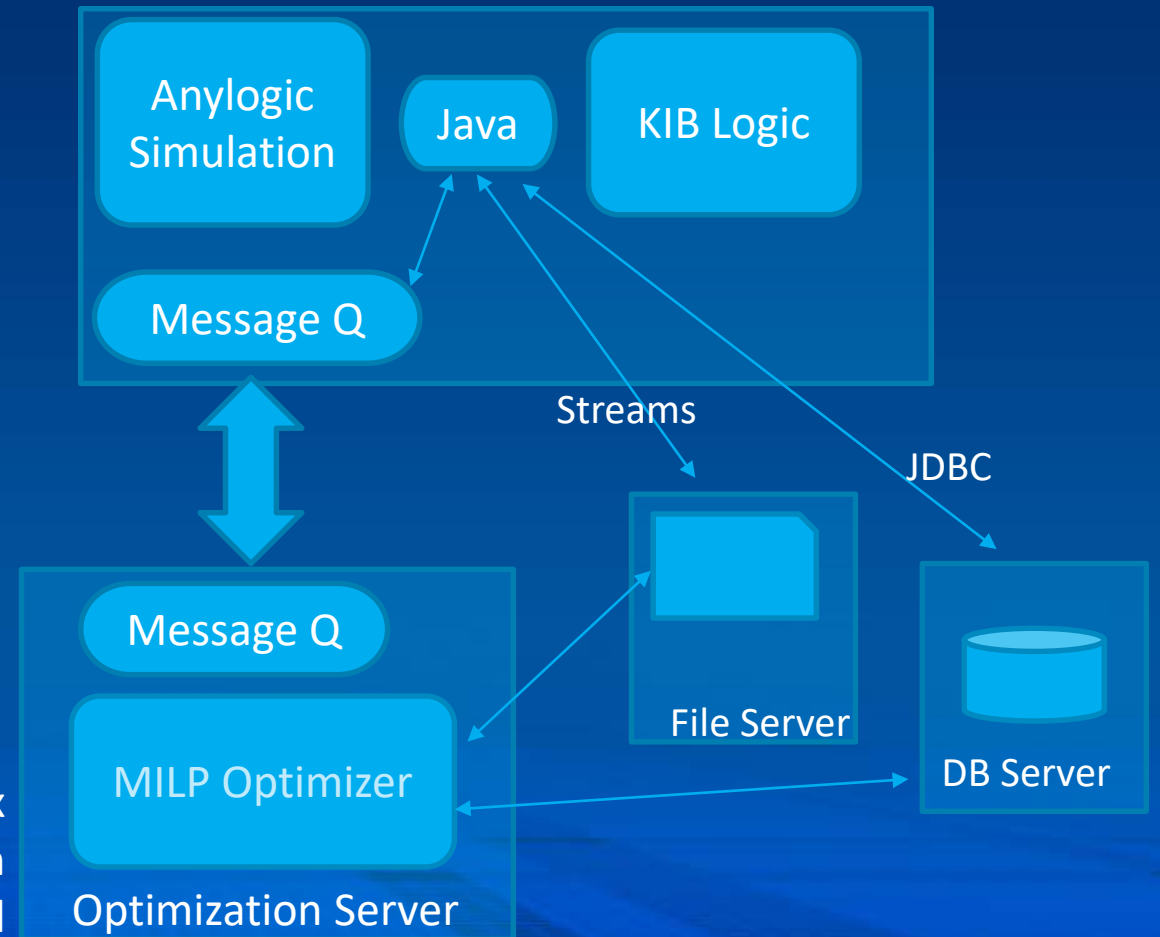
Local – everything in-process



Good when models can run on local machine

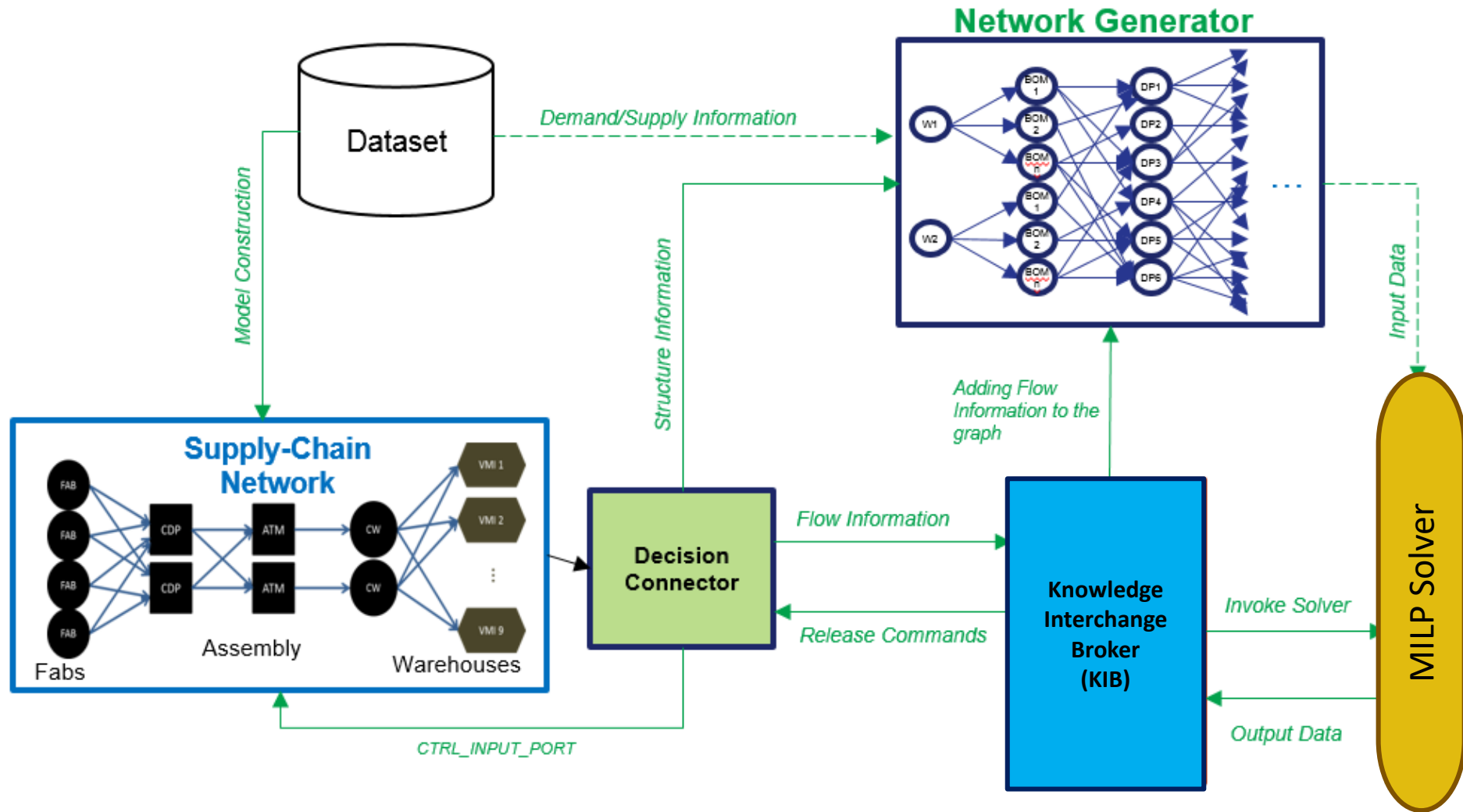
- Easy to configure

Good when models very complex (>Millions Constraints) or want to run many models in parallel



End-to-End Supply Chain Simulation

Enables what-if of end to end supply chain design and scenarios



End-to-End Supply Chain Simulation

Semiconductor manufacturing simulation from supplier to customer.
Enables what-if of supply chain design and scenarios

- Use Cases
 - Test bed for planning and control strategies
 - Analysis on financials and service levels
 - scenarios to procurement strategies
 - Inventory versus Service Level trade-off
 - Transportation trade-offs
- Poly-Formalism Approach
 - Heuristics for Inventory strategy
 - Optimization models for planning algorithms
 - Discrete event simulation for material flows

