

Application of Simulation for Supplier Negotiation

Victor Chang
Software Engineer
Intel Corporation



AnyLogic Conference 2014
San Francisco, CA
November 12 and 13



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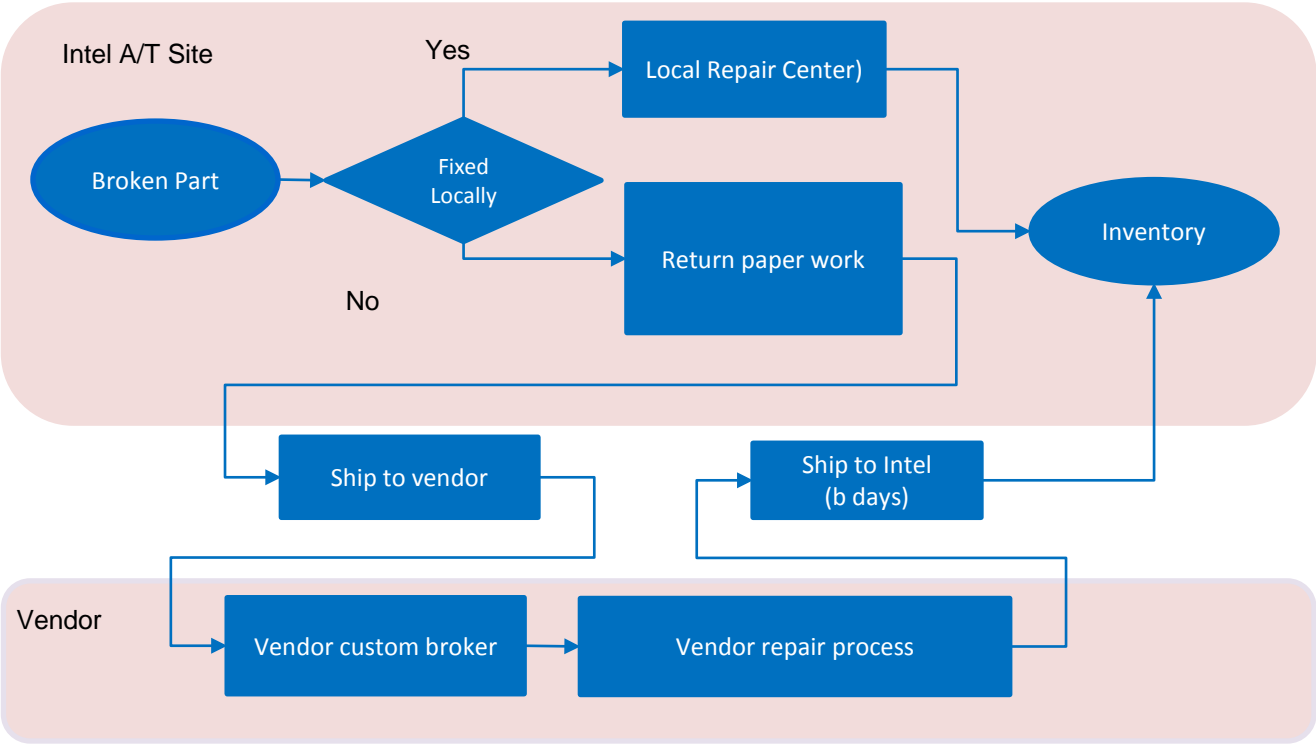
Problem Statement

- Broken parts cause capacity constraints at Intel factories
- Broken parts “stacking up” at the supplier repair center
- Intel and the vendor have different opinions on the root cause of initial situation
- Commodity manager needs data to understand how many spares we need to keep our factory running and use the data for negotiation with the vendor

Some facts about the part

- These parts are expensive and is used on the critical tools (constraint tools in the factory)
- These parts breaks from time to time. And failure rate usually increase with new products been made.
- The broken parts can be repaired locally or may require shipping to the vendor for repair.
- The repair loop takes significant time, it is necessary to have extra spare parts on-hand to keep the equipment running while broken parts are repaired.
- Broken parts cause constraints at some of the sites while some other sites over buying spares

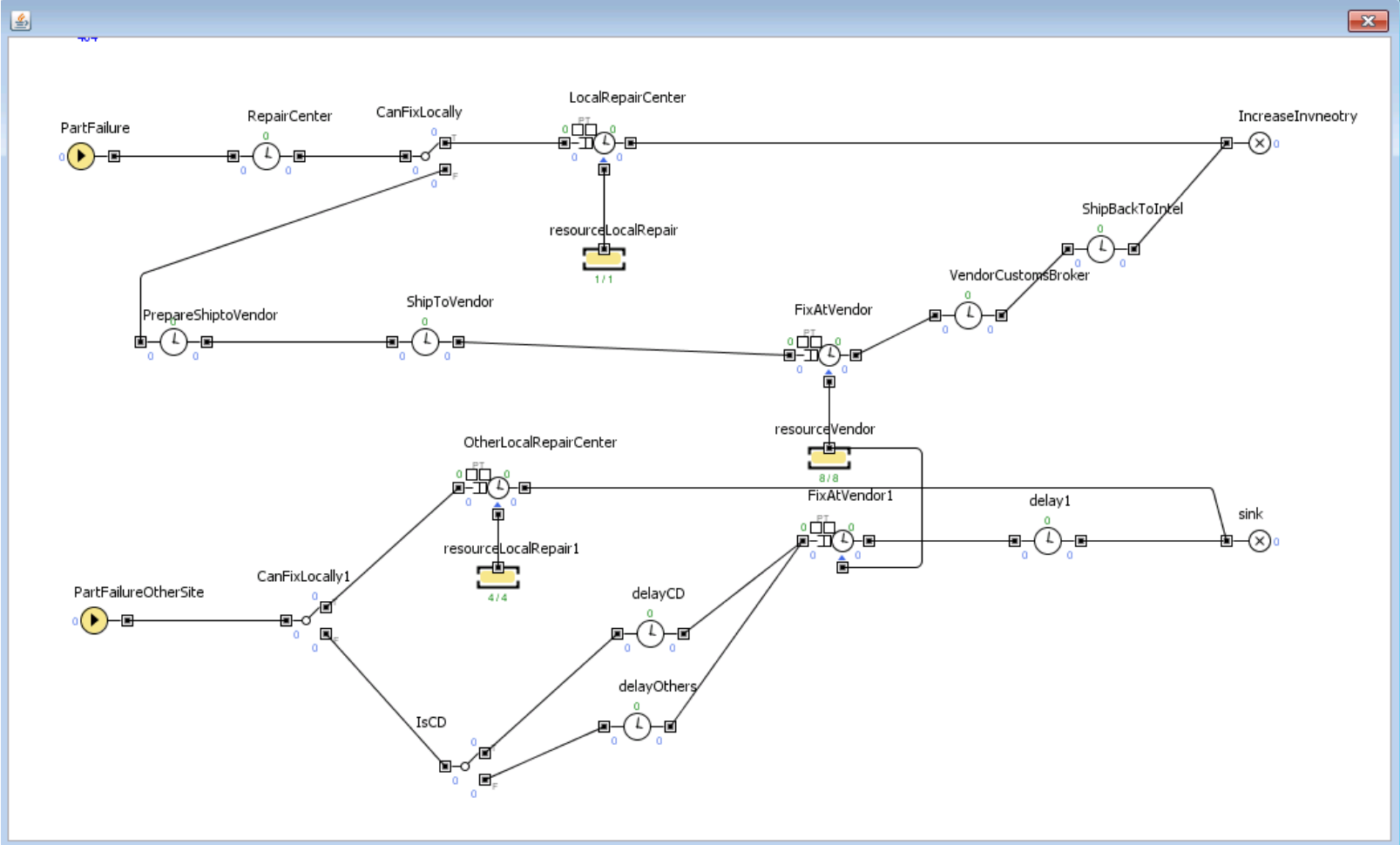
The repair loop



Objective/Goal:

- How many spares should be purchased to:
 - Avoid equipment downtime due to lacks of this part
 - Avoid significantly overbuying the spares.
 - Take into account various failure rate scenarios
- How might changing local and at-supplier repair center staffing/capacity help?
- Support vendor negotiation on the correct part consignment quantity

Anylogic simulation



Anylogic simulation

The screenshot displays the 'CompareRuns' window in AnyLogic Professional. The interface is divided into several sections:

- Top Bar:** Contains standard window controls and the AnyLogic logo.
- Compare Runs Experiment:** Includes a 'Perform Model Run' button and a 'View Network' button.
- Statistics:** Shows '7 samples [162...189], Mean=179.429'.
- Parameters Section:**
 - Number of runs:** A field for the number of simulation runs.
 - Simulate for Site 1:** A checkbox.
 - Other Site parts:** A field for parts at other sites.
 - Weekly Failure Rate:** A field for the failure rate.
 - Other Sites Repair Resource:** A field with the value '4'.
 - Seed:** A field with the value '9.223E18'.
 - Simulation Type:** Radio buttons for 'Random' (selected) and 'Fix Seed'.
- Repair and Ship Time Parameters:** Fields for 'Local Repair Resource', 'Vendor Repair Resource', 'Ship Time from CD to Vendor', 'Ship Time from Intel Site to Vendor (exclude CD)', 'Local Repair Time', 'Vendor Repair Time', and 'Local Repair Rate'.
- Graph:** A line graph titled 'Available parts' showing the quantity of parts over time (0 to 8,000). Multiple colored lines represent different simulation runs (Run 0 to Run 6). The y-axis is labeled 'Available parts' and the x-axis is labeled with run numbers.
- Bottom Bar:** Shows 'Run: 7 Idle', 'Experiment: 0%', 'Simulation: Stop time not set', and 'Memory: 132M of 3,640M'.

User Inputs

Results

Conclusion

- The simulation model takes only a few days to complete after we spoke to the user, identify required data for simulation.
- Commodity managers was able to use the simulation data to convince the supplier that an additional spare parts consignment is needed (A significant saving to Intel).
- The simulation tool is an easy to use standalone application that commodity managers and engineers use to run their own scenarios by changing predefined parameters.
- This simulation can be modify easily to used on other spare parts.