MunEDA WiCkeD™ SPT - Automated Schematic Porting Tool

MunEDA SPT Schematic Porting - User Benefits

- **Industry's first commercially-available automated porting solution**
- **Automated schematic porting 10-100X faster than manual porting**
- **Improves designers' productivity and simplifies designers' jobs**
- **Consistently achieves repeatable and verified results**
- **Re-size porting results with MunEDA WiCkeD tools for analysis, modeling and automatic sizing**

Schematic Porting between Different Processes

The migration of circuit schematics between different process technologies and process design kits (PDKs) can be a very time-consuming, uncomfortable and boring task for a circuit designer.

At the beginning of – or during – a new design project, it is often necessary to use and re-use available IP (intellectual property) and circuits from previous projects, instead of designing everything from scratch. Often a new design uses a new or different process technology. Thus, it is necessary to migrate and apply given circuit schematics for use with this new target technology. Consequently, circuit designers very often must adapt schematics to the new process by changing circuit symbols, default values, scaling and other characteristics – a time-consuming and tedious manual effort.

IP Porting – Types and Challenges

IP porting can be versatile, and it includes different tasks:

- **Horizontal Porting:** Migrating IP from one technology node to the same node of a different foundry due to second sourcing, fab consolidation or foundry migration.
- **Vertical Porting:** Migrating IP from a technology node to a smaller one, usually from the same fab or foundry.

Both are challenging, especially for analog-/mixed-signal designs, RF designs, IP libraries and memory cells because many blocks and even entire SoCs must be migrated in a short time, mostly by a very limited number of designers. Furthermore, there is no simple rule for shrinking AMS/RF, I/O and full-custom digital designs. Every block needs adjustment of geometries, biasing, etc. even if specs don't change. Therefore, it is necessary to migrate and port the schematics individually to conform with technology constraints, or to meet enhanced functionality or performance specifications.

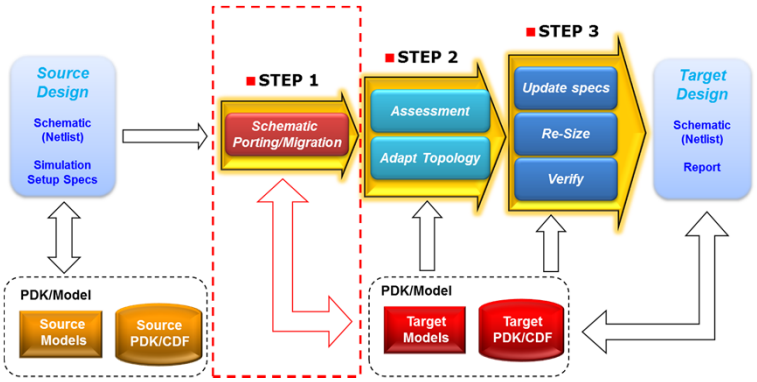
Migrating IP is a challenge because:

- Different device parameters (vth, etc.) require adjustment of biasing and small-signal parameters
- W, L shrinking is desirable, but not as simple as digital
- Some devices (mimcaps, inductors, etc.) may or may not be available, or may be of a quite different type
- Circuit topology may need modification
- Layout shrinking in integrated technologies is insufficient

Andreas Ripp, Vice President Sales & Marketing: "IP and Schematic Porting is one of the key topics and therefore is MunEDA SPT the right answer to meet growing industry demand. MunEDA developed this outstanding methodology as we see the absolute need and demand from our customers for such a solution."

3-Step Schematic Porting, Assessment & Sizing Flow

When retargeting circuit designs from a given source process to a new process, the source design schematics are adapted primarily using a 3-step flow.



Picture: 3-Step Schematic Porting, Assessment & Sizing Flow

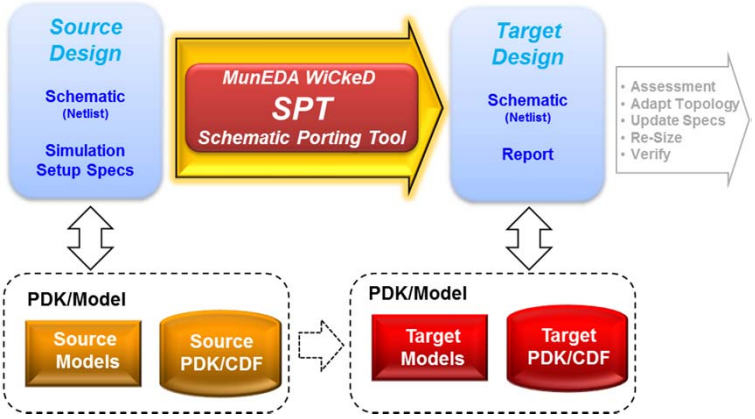
1. Schematics are ported and migrated to the new target process using the models and PDK/CDF from the target process technology. This task is very often done manually, but can be automated easily.
2. After migration of all such schematics, the circuit designer assesses the ported IP and adapts the circuit topologies – when necessary – in schematic view.
3. Based on updates of the circuit specifications, the designer analyzes and re-sizes the circuits (for example, with other MunEDA WiCkeD™ tools) and verifies results such as circuit functionality, performance, yield, and robustness (for example, with simulation such as SPICE).

These steps also can include iterations where necessary.

MunEDA – SPT Schematic Porting Tool

The task of schematic porting now can be automated and easily accelerated by using the SPT schematic porting tool, part of MunEDA's WiCkeD™ design tool suite. MunEDA SPT supports designers with an automated schematic migration, replacing cells with corresponding cells in the new library. The tool:

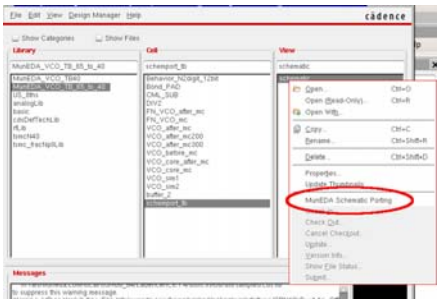
- Replaces devices in the schematic with their counterpart (source PDK → target PDK)
- Provides flexible property mapping and automated shrinking, is configurable, and can handle MOS, R, C, and other properties
- Walks hierarchically through the schematics



MunEDA SPT Implementation & Interfaces

The MunEDA WiCkeD SPT Schematic Porting Tool:

- Is fully integrated into Cadence® Virtuoso® based unified custom/analog flow including SKILL context files, wrapper scripts and configuration scripts
- Includes user reference documentation for installation, configuration and usage



Picture: MunEDA SPT Schematic Porting Menu Item in Virtuoso® Library Manager

MunEDA SPT Schematic Porting – Technology Support

- **Configurable for many source/target process technologies**
- **Configurations available from MunEDA for major TSMC process technologies (e.g. tsmcN65 & tsmcN45).**
- **Further process technologies can be supported on request**
- **For more information and support contact www.muneda.com**

Michael Pronath, MunEDA Vice President Products & Solutions: "MunEDA SPT offers circuit designers an easy-to-handle solution to make their lives easier and more comfortable. Manual schematic porting usually is a very tedious and boring task. But this task can be highly automated and can offer tremendous speed -up compared to manual schematic and IP porting."

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