

Blueprint Platform Designer User Guide

2014.12.15



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The Quartus II Blueprint Platform Designer helps you to efficiently plan constraints for design implementation. Use Blueprint to place synthesized and Fitter-generated design elements, including entire IP cores and interfaces, onto a device periphery floorplan. Blueprint provides accurate, real-time feedback about legal and alternative logic placement. Blueprint uses realtime communication with the Fitter to verify the legality of your Blueprint floorplan. Fitter verification ensures the highest correlation between your Blueprint floorplan and actual implementation results. You can apply the Blueprint floorplan to your project with high confidence in the final implementation.

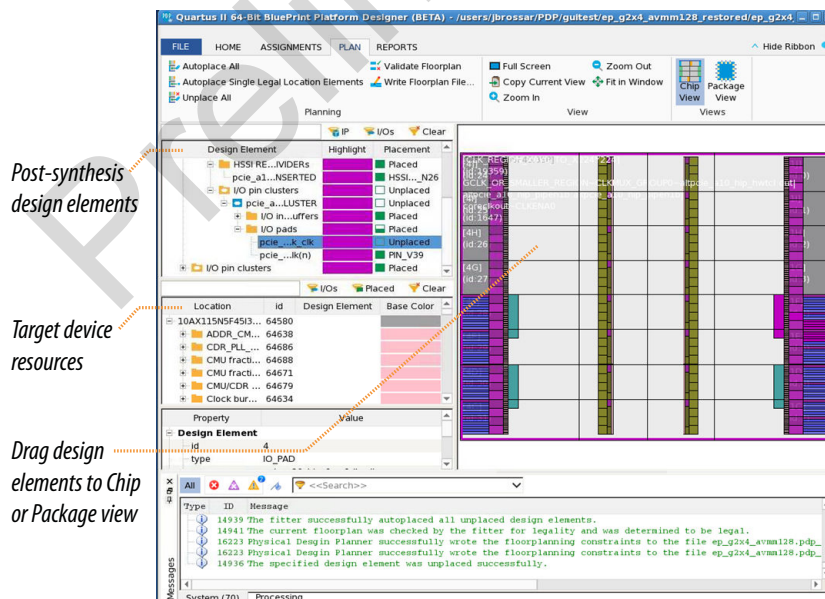
Blueprint Platform Designer Features

- Quickly determine legal design floorplans at any stage of the design process.
- Accurately evaluate placement legality using the Fitter place and route engine.
- Report alternative placement to improve performance and resources.

Quick Start

Blueprint is a beta feature of the Quartus II software version 14.1. Contact your Altera sales representative to enable the tool. Once enabled, click **Tools > Blueprint Platform Designer**, or type `quartus_pdp <project name>` to start Blueprint.

Figure 1: Blueprint Platform Designer



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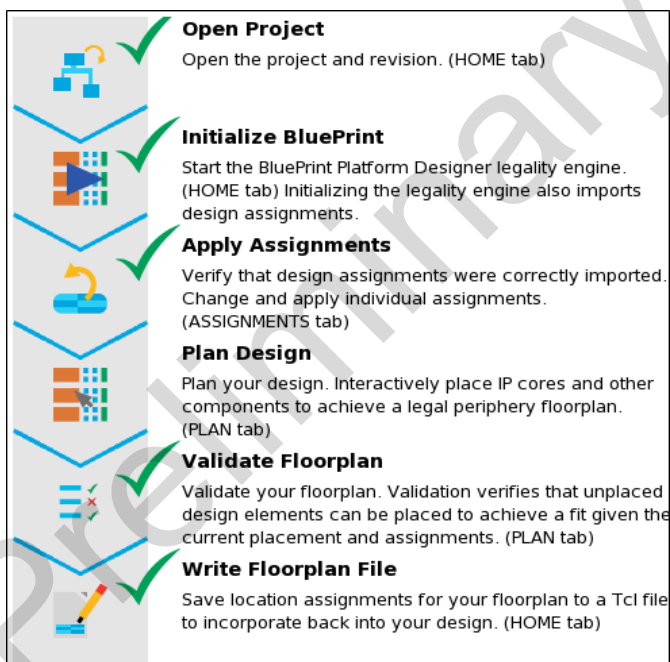


BluePrint Platform Designer Overview

Once initialized, BluePrint displays your project's logical hierarchy, post-synthesis design elements, and Fitter-created design elements, alongside a view of target device locations. BluePrint's design elements include technology-mapped design primitives, Fitter modeling constructs, and instances in the logical hierarchy. You interact directly with these elements, and verify placement using the actual Fitter, to ensure accurate correlation with final implementation.

Drag and drop the design elements onto the target device to view real-time, accurate feedback about legal placement options. BluePrint also validates your plan against any existing location assignments imported from the project. You can disable or enable imported project assignments to resolve any conflicts and evaluate different BluePrint floorplans. Once you are satisfied with the BluePrint floorplan for important interfaces and design elements, you can validate the BluePrint floorplan by automatically placing any remaining logic. You can then apply the BluePrint floorplan to your project via a Tcl file.

Figure 2: BluePrint Platform Design Flow



BluePrint User Interface

BluePrint's user interface guides you through the platform design flow.

Figure 3: BluePrint Tabs Ribbon

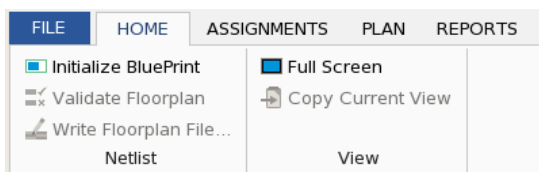


Table 1: BluePrint Task Reference

GUI Location	BluePrint Planning Task
File tab	Open or close a Quartus II project in BluePrint.
Home tab	Initialize BluePrint legality engine and load design assignments.
Assignments tab	Directly disable any conflicting or illegal design assignments (constraints) discovered in your synthesized project.
Plan tab	Use drag and drop to interactively floorplan placement with real-time validation and feedback.
Reports tab	View generated reports about legal placements for selected design entities.

Planning Implementation Constraints

Planning implementation constraints in BluePrint involves running initial design synthesis, initializing BluePrint, reconciling imported project assignments, and applying the BluePrint floorplan to your Quartus II project. The following steps describe this flow in detail.

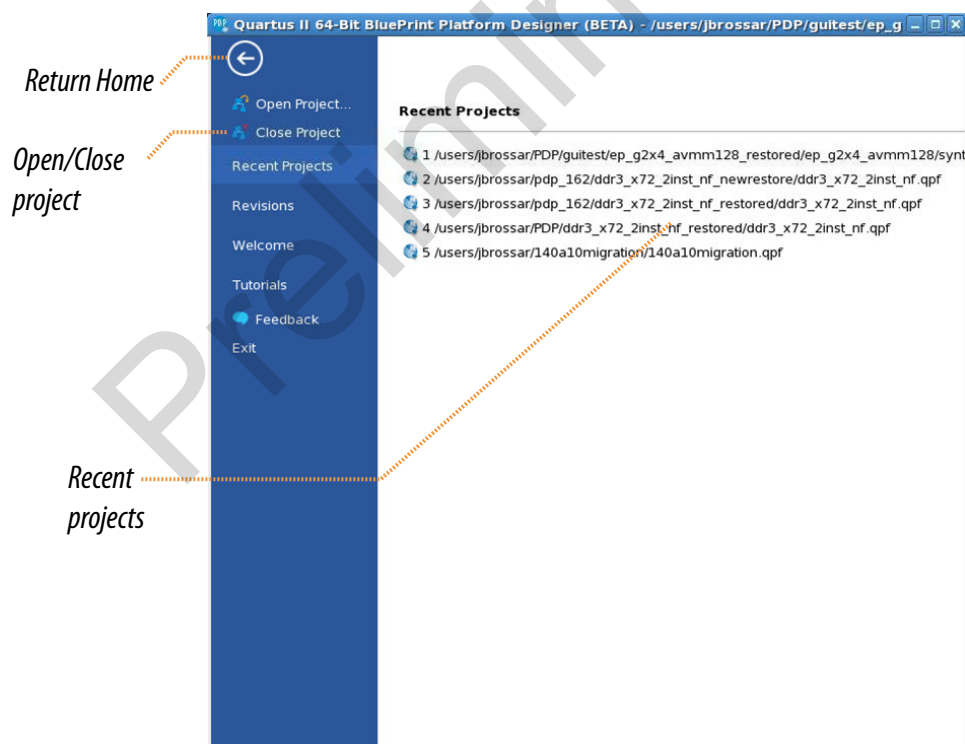
- Run initial design synthesis:
 - In the Quartus II software, click **File > Open Project** and open a Quartus II project containing your partial or complete design.
 - Click **Assignments > Pin Planner** and assign the I/O bank voltage and drive strength for all general purpose pins.
 - Click **Processing > Start > Start Analysis & Synthesis** to synthesize your design logic. BluePrint requires a synthesized design.
- Click **Tools > BluePrint Platform Designer** to open the current project in BluePrint. To open any other project, on the **File** tab, click **Open Project**.
- Initialize BluePrint verification engine and import any existing assignments:
 - On the **Home** tab, click **Initialize BluePrint** to start the Fitter legality engine and import any project assignments. Imported assignments appear on the **Assignments** tab.
 - On the **Assignments** tab, modify or remove any existing assignment and view impact on the floorplan. Click **Apply Assignments** to apply changes.
- Floorplan placement assignments:
 - Click the **Plan** tab and perform one or more of the following:

- Drag IP cores and other **Design Elements** into the target device **Chip View** or **Map View**. BluePrint displays dynamic feedback about placement.
 - Right-click any design element and click **Report Replaceability of Selected Element** to display detailed information about suitable target resources on the **Reports** tab.
 - Select and **Autoplace** specific design elements from the right-click menu.
 - Click **Validate Floorplan** to validate your plan.
- b. When you are satisfied with the validated floorplan, click **Write Floorplan File** to generate a Tcl script that implements the floorplan in your project. The Tcl file contains instructions to apply the floorplan file.
 - c. Close BluePrint.
5. Apply your BluePrint plan to your Quartus II project:
 - a. Open your Quartus II project.
 - b. Type the following command to apply your BluePrint plan to the project: `quartus_sh -t <Tcl Script File> pdp_assignments.tcl`

Opening a Project in BluePrint

Open and synthesize your project in the Quartus II software before launching BluePrint. BluePrint then automatically opens the current Quartus II project. Click **Open Project** on the **File** tab to open a different project. Click **Revisions** to open a specific project revision. Click **Home** to return to that tab.

Figure 4: BluePrint Platform Designer (File Tab)



Initializing BluePrint

Click the **Home** tab to initialize BluePrint and import design assignments.

Figure 5: BluePrint Platform Designer (Home Tab)

Start Fitter
verification engine
and import
assignments

Step complete

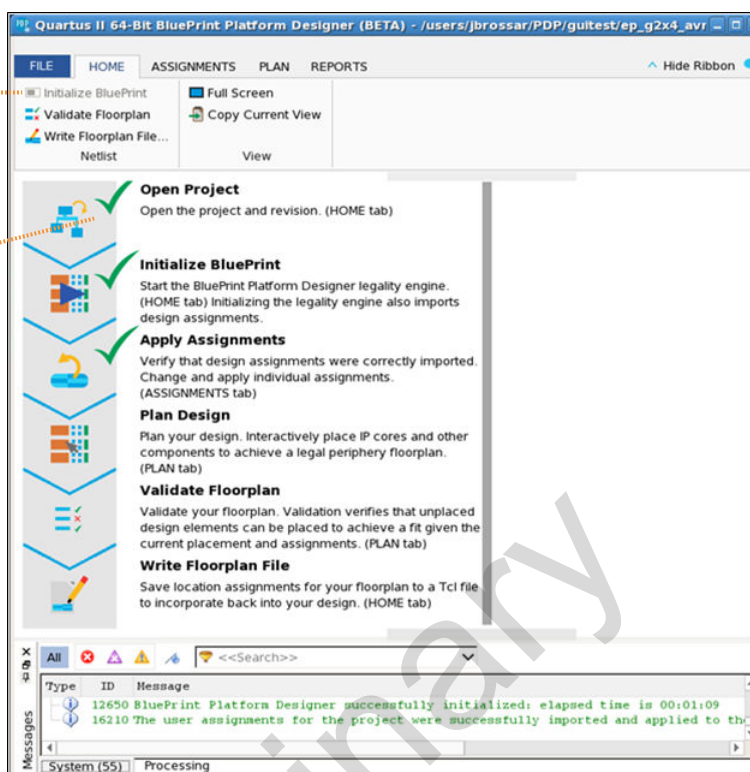


Table 2: Home Tab Commands

Command	Description
Initialize BluePrint	Loads the synthesis netlist, starts the Fitter verification engine, and imports design assignments.
Validate Floorplan	Validates your plan by verifying that all unplaced design elements can be placed. Review and correct any conflicting assignments on the Assignments tab.
Write Floorplan File	Saves the floorplan file to a Tcl script that you can apply to your project.

Reconciling Imported Project Assignments

Click the **Assignments** tab to display any placement assignments imported from your synthesized project. BluePrint reports any conflicting or illegal assignments discovered by the Fitter legality checking. You can disable any illegal or conflicting design assignments. You can also disable assignments that prevent placement of a design element in a desired location.

Figure 6: BluePrint Platform Designer (Assignments Tab)

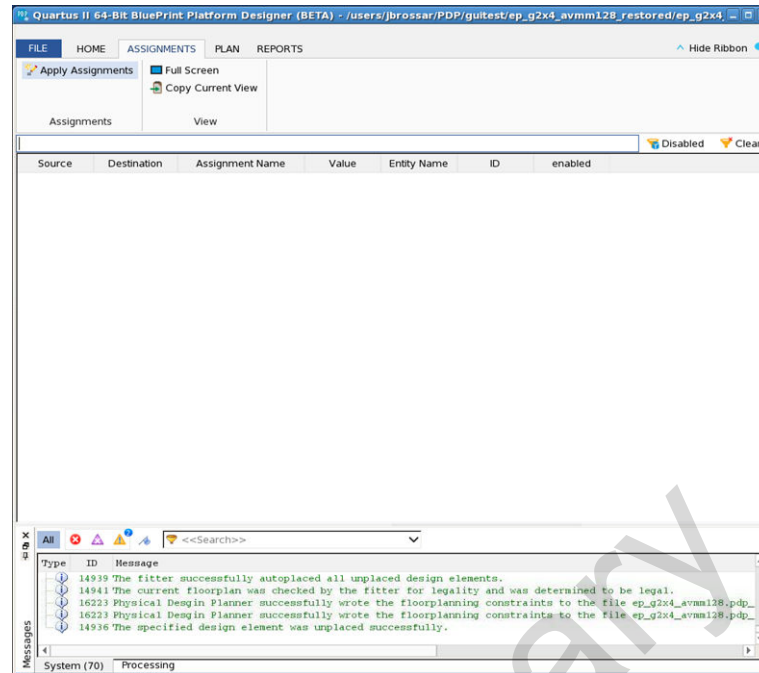


Table 3: Assignments Tab Commands

Command	Description
Apply Assignments	Attempts to apply all enabled assignments to the design.
Disabled	Filters the list to show only disabled assignments.
Clear	Clears the filter from the assignments list.
Copy Current View	Copies the current view to the clipboard.

Planning Logic Placement

Click the **Plan** tab to interactively prototype periphery logic placement scenarios. The **Plan** tab displays a list of your project's design elements, alongside a graphical abstraction of the target device architecture. You can drag and drop design elements onto available device resources. Device resources are color coded by type, allowing quick access to any structure. BluePrint accurately evaluates the constraints using Fitter and provides legality and performance feedback.

Figure 7: Blueprint Platform Designer (Plan Tab)

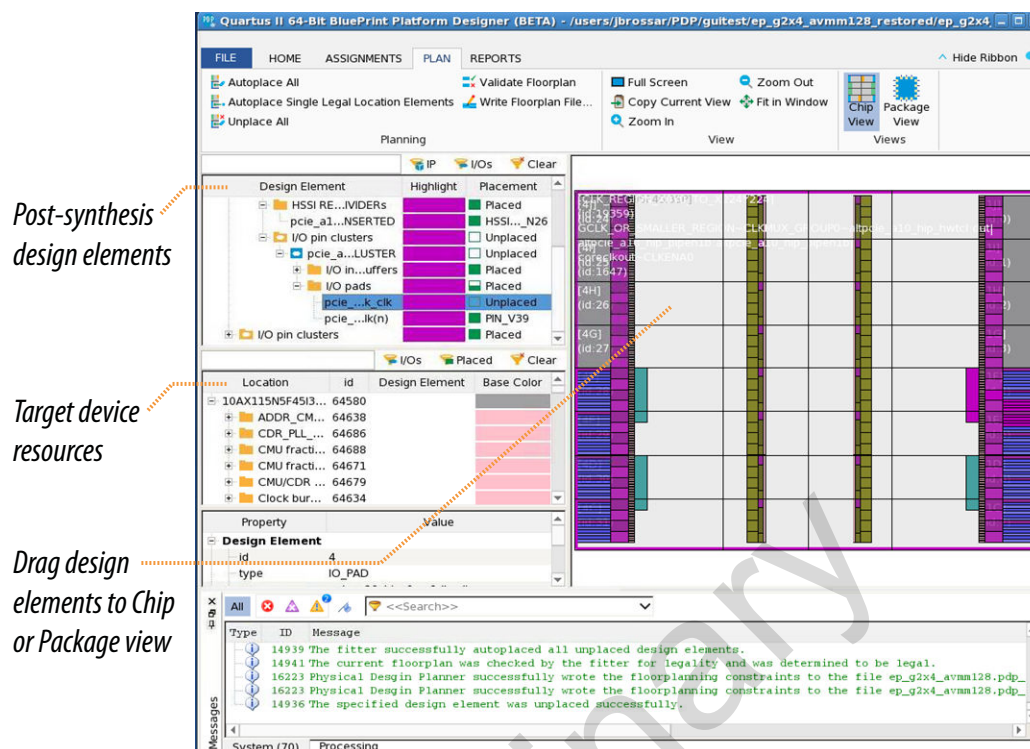


Table 4: Plan Tab Commands

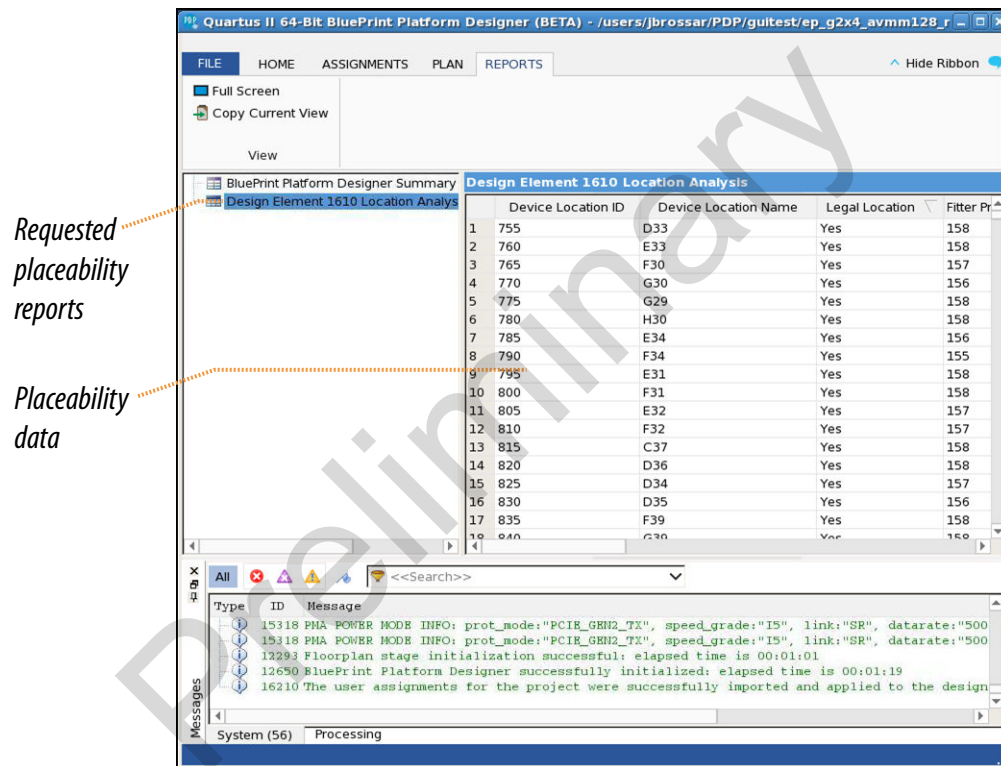
Command	Description
Autoplace All	Attempts to place all unplaced design elements in legal locations to validate the overall Blueprint floorplan.
Autoplace single legal location elements	Attempts to place all design elements that have only a single legal location.
Unplace All	Unplaces all placed design elements.
Right-click > Auto-place selected element	Attempts to place the selected design element and all of its children in a legal location.
Validate floorplan	Verifies that your planned constraints are compatible with placement of all remaining unplaced design elements. You can then directly locate and resolve the source of any reported validation errors.
Write Floorplan File	Saves your floorplan to a file for subsequent application to your project.
Chip View	Displays the target device chip details.
Package View	Displays the target device package details.
Right-click > Report Placeability of Selected Element	Displays detailed information on the Reports tab about the ability to place the selected design element into each of the device locations of that type.

Command	Description
Copy Current View	Copies the current BluePrint floorplan to the clipboard for pasting into other files, such as word processing or presentation files.

Identifying Legal Placements

You can drag any design element into the device view and hover over any resource to determine placement suitability. Alternatively you can generate a report identifying all legal placement options for any design element. On the **Plan** tab, select any design element or device resource and click **Report Placeability of Selected Element** to generate a report listing all legal placement options on the **Reports** tab. You can **Export** the contents of the report for analysis.

Figure 8: BluePrint Platform Designer (Reports Tab)



Applying the BluePrint Floorplan

Once you are satisfied with your BluePrint floorplan, apply the plan to your Quartus II project using a generated Tcl script. The Tcl script contains instructions for running.

Type the following command to apply your BluePrint plan to the project: `quartus_sh -t <Tcl Script File>pdp_assignments.tcl`

Document Revision History

This document has the following revision history.

Date	Version	Changes
2014.12.15	14.1.0	First beta release of document on Molson.

Preliminary