

Release Notes

IVT 7.43 Note 1 IVT 7.43 requires ISE 13.4, ISE 14.1, ISE 14.2, ISE 14.3, ISE 14.4, ISE 14.5, ISE 14.6, or ISE 14.7 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 13.4	IVT 7.43	bin\13.4\nt\ivt.exe
nt64	ISE 13.4	IVT 7.43	bin\13.4\nt64\ivt.exe
lin	ISE 13.4	IVT 7.43	bin/13.4/lin/ivt
lin64	ISE 13.4	IVT 7.43	bin/13.4/lin64/ivt
nt	ISE 14.1	IVT 7.43	bin\14.1\nt\ivt.exe
nt64	ISE 14.1	IVT 7.43	bin\14.1\nt64\ivt.exe
lin	ISE 14.1	IVT 7.43	bin/14.1/lin/ivt
lin64	ISE 14.1	IVT 7.43	bin/14.1/lin64/ivt
nt	ISE 14.2	IVT 7.43	bin\14.2\nt\ivt.exe
nt64	ISE 14.2	IVT 7.43	bin\14.2\nt64\ivt.exe
lin	ISE 14.2	IVT 7.43	bin/14.2/lin/ivt
lin64	ISE 14.2	IVT 7.43	bin/14.2/lin64/ivt
nt	ISE 14.3	IVT 7.43	bin\14.3\nt\ivt.exe
nt64	ISE 14.3	IVT 7.43	bin\14.3\nt64\ivt.exe
lin	ISE 14.3	IVT 7.43	bin/14.3/lin/ivt
lin64	ISE 14.3	IVT 7.43	bin/14.3/lin64/ivt
nt	ISE 14.4	IVT 7.43	bin\14.4\nt\ivt.exe
nt64	ISE 14.4	IVT 7.43	bin\14.4\nt64\ivt.exe
lin	ISE 14.4	IVT 7.43	bin/14.4/lin/ivt
lin64	ISE 14.4	IVT 7.43	bin/14.4/lin64/ivt
nt	ISE 14.5	IVT 7.43	bin\14.5\nt\ivt.exe
nt64	ISE 14.5	IVT 7.43	bin\14.5\nt64\ivt.exe
lin	ISE 14.5	IVT 7.43	bin/14.5/lin/ivt
lin64	ISE 14.5	IVT 7.43	bin/14.5/lin64/ivt
nt	ISE 14.6	IVT 7.43	bin\14.6\nt\ivt.exe
nt64	ISE 14.6	IVT 7.43	bin\14.6\nt64\ivt.exe
lin	ISE 14.6	IVT 7.43	bin/14.6/lin/ivt

OS Platform	ISE Version	IVT Version	Archive Path
lin64	ISE 14.6	IVT 7.43	bin/14.6/lin64/ivt
nt	ISE 14.7	IVT 7.43	bin\14.7\nt\ivt.exe
nt64	ISE 14.7	IVT 7.43	bin\14.7\nt64\ivt.exe
lin	ISE 14.7	IVT 7.43	bin/14.7/lin/ivt
lin64	ISE 14.7	IVT 7.43	bin/14.7/lin64/ivt

Table 1 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 7.43 Note 2 Repaired a NCD-mode defect preventing the processing of NCD files containing modules with names containing non-alphanumeric characters such as periods and brackets.

IVT 7.43 Note 3 SSIT devices such as the xc7v2000t are not supported at this time.

IVT 7.41 Note 1 IVT 7.41 requires ISE 13.4, ISE 14.2, ISE 14.4, ISE 14.5, ISE 14.6, or ISE 14.7 to be installed as the current version of ISE. Support for ISE 14.7 is preliminary. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 13.4	IVT 7.41	bin\13.4\nt\ivt.exe
nt64	ISE 13.4	IVT 7.41	bin\13.4\nt64\ivt.exe
lin	ISE 13.4	IVT 7.41	bin/13.4/lin/ivt
lin64	ISE 13.4	IVT 7.41	bin/13.4/lin64/ivt
nt	ISE 14.2	IVT 7.41	bin\14.2\nt\ivt.exe
nt64	ISE 14.2	IVT 7.41	bin\14.2\nt64\ivt.exe
lin	ISE 14.2	IVT 7.41	bin/14.2/lin/ivt
lin64	ISE 14.2	IVT 7.41	bin/14.2/lin64/ivt
nt	ISE 14.4	IVT 7.41	bin\14.4\nt\ivt.exe
nt64	ISE 14.4	IVT 7.41	bin\14.4\nt64\ivt.exe
lin	ISE 14.4	IVT 7.41	bin/14.4/lin/ivt
lin64	ISE 14.4	IVT 7.41	bin/14.4/lin64/ivt
nt	ISE 14.5	IVT 7.41	bin\14.5\nt\ivt.exe
nt64	ISE 14.5	IVT 7.41	bin\14.5\nt64\ivt.exe
lin	ISE 14.5	IVT 7.41	bin/14.5/lin/ivt
lin64	ISE 14.5	IVT 7.41	bin/14.5/lin64/ivt
nt	ISE 14.6	IVT 7.41	bin\14.6\nt\ivt.exe
nt64	ISE 14.6	IVT 7.41	bin\14.6\nt64\ivt.exe
lin	ISE 14.6	IVT 7.41	bin/14.6/lin/ivt

OS Platform	ISE Version	IVT Version	Archive Path
lin64	ISE 14.6	IVT 7.41	bin/14.6/lin64/ivt
nt	ISE 14.7*	IVT 7.41	bin\14.7\nt\ivt.exe
nt64	ISE 14.7*	IVT 7.41	bin\14.7\nt64\ivt.exe
lin	ISE 14.7*	IVT 7.41	bin/14.7/lin/ivt
lin64	ISE 14.7*	IVT 7.41	bin/14.7/lin64/ivt

Table 2 – IVT location by operating system and ISE version.

* – IVT support for ISE 14.7 is preliminary.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 7.41 Note 2 Removed special-case code related to Zynq PS7 tile that was shown to be redundant. IVT 7.41 functionality should be identical to IVT 7.40.

IVT 7.40 Note 1 IVT 7.40 requires ISE 13.4, ISE 14.2, ISE 14.4, ISE 14.5, or ISE 14.6 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 13.4	IVT 7.40	bin\13.4\nt\ivt.exe
nt64	ISE 13.4	IVT 7.40	bin\13.4\nt64\ivt.exe
lin	ISE 13.4	IVT 7.40	bin/13.4/lin/ivt
lin64	ISE 13.4	IVT 7.40	bin/13.4/lin64/ivt
nt	ISE 14.2	IVT 7.40	bin\14.2\nt\ivt.exe
nt64	ISE 14.2	IVT 7.40	bin\14.2\nt64\ivt.exe
lin	ISE 14.2	IVT 7.40	bin/14.2/lin/ivt
lin64	ISE 14.2	IVT 7.40	bin/14.2/lin64/ivt
nt	ISE 14.4	IVT 7.40	bin\14.4\nt\ivt.exe
nt64	ISE 14.4	IVT 7.40	bin\14.4\nt64\ivt.exe
lin	ISE 14.4	IVT 7.40	bin/14.4/lin/ivt
lin64	ISE 14.4	IVT 7.40	bin/14.4/lin64/ivt
nt	ISE 14.5	IVT 7.40	bin\14.5\nt\ivt.exe
nt64	ISE 14.5	IVT 7.40	bin\14.5\nt64\ivt.exe
lin	ISE 14.5	IVT 7.40	bin/14.5/lin/ivt
lin64	ISE 14.5	IVT 7.40	bin/14.5/lin64/ivt
nt	ISE 14.6	IVT 7.40	bin\14.6\nt\ivt.exe
nt64	ISE 14.6	IVT 7.40	bin\14.6\nt64\ivt.exe

OS Platform	ISE Version	IVT Version	Archive Path
lin	ISE 14.6	IVT 7.40	bin/14.6/lin/ivt
lin64	ISE 14.6	IVT 7.40	bin/14.6/lin64/ivt

Table 3 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 7.40 Note 2 The following architectures are supported:

- Artix7
- Artix7 Low Voltage
- Automotive Artix7
- Automotive Spartan6
- Automotive Virtex4
- Automotive Zynq
- Defense-Grade Artix7
- Defense-Grade Artix7 Low Voltage
- Defense-Grade Kintex7
- Defense-Grade Kintex7 Low Voltage
- Defense-Grade Spartan-6Q
- Defense-Grade Spartan-6Q Lower Power
- Defense-Grade Virtex-4Q
- Defense-Grade Virtex-5Q
- Defense-Grade Virtex-6Q
- Defense-Grade Virtex-6Q Lower Power
- Defense-Grade Virtex7
- Defense-Grade Zynq
- Kintex7
- Kintex7 Low Voltage
- Space-Grade Virtex-4QV
- Spartan6
- Spartan6 Lower Power
- Virtex4
- Virtex5
- Virtex6
- Virtex6 Lower Power
- Virtex7
- Zynq

Virtex6 devices may work but have not been tested. The Virtex7 SSIT devices are not supported. Virtex4 designs may generate spurious violations related to PIPs if Trusted Bus Macros are present.

IVT 7.40 Note 3 IVT 7.40 supports Zynq devices. IVT verifies that isolated resources adjacent to the left side of the Processing Subsystem (PSS) match the isolation group of the PSS. The bottom of the PSS does not require a fence.

IVT 7.40 Note 4 For Zynq designs, IVT 7.40 verifies that the Processing Subsystem is included in an isolation group.

IVT 7.40 Note 5 For 7 series devices, IVT 7.40 verifies that the config center area is not used as a fence. The config center area is rendered with vertical hatching.

IVT 7.40 Note 6 For 7 series devices, the clock column cannot be used as a vertical fence. IVT verifies this. IVT 7.40 marks the clock column with vertical hatching.

IVT 7.40 Note 7 For 7 series devices, GTXE2 transceivers sharing an I/O bank cannot be split across isolation groups. IVT verifies this.

IVT 7.27 Note 1 IVT 7.27 requires ISE 13.4, ISE 14.2, ISE 14.4 or ISE 14.5 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 13.4	IVT 7.27	bin\13.4\nt\ivt.exe
nt64	ISE 13.4	IVT 7.27	bin\13.4\nt64\ivt.exe
lin	ISE 13.4	IVT 7.27	bin/13.4/lin/ivt
lin64	ISE 13.4	IVT 7.27	bin/13.4/lin64/ivt
nt	ISE 14.2	IVT 7.27	bin\14.2\nt\ivt.exe
nt64	ISE 14.2	IVT 7.27	bin\14.2\nt64\ivt.exe
lin	ISE 14.2	IVT 7.27	bin/14.2/lin/ivt
lin64	ISE 14.2	IVT 7.27	bin/14.2/lin64/ivt
nt	ISE 14.4	IVT 7.27	bin\14.4\nt\ivt.exe
nt64	ISE 14.4	IVT 7.27	bin\14.4\nt64\ivt.exe
lin	ISE 14.4	IVT 7.27	bin/14.4/lin/ivt
lin64	ISE 14.4	IVT 7.27	bin/14.4/lin64/ivt
nt	ISE 14.5	IVT 7.27	bin\14.5\nt\ivt.exe
nt64	ISE 14.5	IVT 7.27	bin\14.5\nt64\ivt.exe
lin	ISE 14.5	IVT 7.27	bin/14.5/lin/ivt
lin64	ISE 14.5	IVT 7.27	bin/14.5/lin64/ivt

Table 4 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 7.27 Note 2 The following architectures are supported:

- Automotive Spartan6
- Automotive Virtex4
- Kintex7
- Kintex7 Low Voltage
- Defense-Grade Kintex7
- Defense-Grade Kintex7 Low Voltage
- Space-Grade Virtex-4QV
- Defense-Grade Spartan-6Q
- Defense-Grade Spartan-6Q Lower Power
- Defense-Grade Virtex-4Q
- Defense-Grade Virtex-5Q
- Defense-Grade Virtex7
- Defense-Grade Virtex7 Low Voltage
- Spartan6
- Spartan6 Lower Power
- Virtex4
- Virtex5

Other device families including Virtex6, Virtex7, and Zynq may work but have not been tested.

IVT 7.27 Note 3 Kintex-7 support includes checking of the CMT columns and the Config Center area.

IVT 7.27 Note 4 Area range checking considers the site type of the range constraint. Area ranges outlines are no longer filled because this incorrectly implies that all sites contained in the outline are included in the range, yet only site of the type associated with the range are actually included. When the SVG output of IVT is viewed in a modern web browser, a tool tip provides the text of the area range constraint under the mouse pointer.

IVT 7.27 Note 5 Tiles devoid of isolated logic and routing that are not valid as fence tiles are marked with an inset diamond color-coded to indicate the isolated region or regions the influence of which cannot be excluded. When multiple isolated regions taint a tile, bright orange is used to indicate this. In addition to the diamond-shaped taint marker, a small square is drawn in the center of a tile to indicate a Programmable Interconnect Point (PIP) is used to form a route in the tile. Note: PIPs are only rendered in invalid fence tiles.

IVT 7.27 Note 6 Previous versions of IVT did not correctly check that isolated Spartan-6 DSP blocks were separated by two unused DSP blocks. (The correct gap is eight or more interconnect tiles in height.)

IVT 7.27 Note 7 Spartan-6-1L devices are supported.

IVT 7.27 Note 8 The presence of the CONFIG INTERNAL_VREF constraint no longer triggers an error message.

IVT 7.27 Note 9 Previous versions of IVT did not correctly check isolation violations involving the PCIE block.

IVT 7.13 Note 1 IVT 7.13 requires ISE 12.4, ISE 13.1, ISE 13.2, ISE 13.3, ISE 13.4 or ISE 14.1 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,

nt64 Microsoft Windows NT and later 64-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.4	IVT 7.13	bin\12.4\nt\ivt.exe
nt64	ISE 12.4	IVT 7.13	bin\12.4\nt64\ivt.exe
lin64	ISE 12.4	IVT 7.13	bin/12.4/lin64/ivt
nt	ISE 13.1	IVT 7.13	bin\13.1\nt\ivt.exe
nt64	ISE 13.1	IVT 7.13	bin\13.1\nt64\ivt.exe
lin64	ISE 13.1	IVT 7.13	bin/13.1/lin64/ivt
nt	ISE 13.2	IVT 7.13	bin\13.2\nt\ivt.exe
nt64	ISE 13.2	IVT 7.13	bin\13.2\nt64\ivt.exe
lin	ISE 13.2	IVT 7.13	bin/13.2/lin/ivt
lin64	ISE 13.2	IVT 7.13	bin/13.2/lin64/ivt
nt	ISE 13.3	IVT 7.13	bin\13.3\nt\ivt.exe
nt64	ISE 13.3	IVT 7.13	bin\13.3\nt64\ivt.exe
lin	ISE 13.3	IVT 7.13	bin/13.3/lin/ivt
lin64	ISE 13.3	IVT 7.13	bin/13.3/lin64/ivt
nt	ISE 13.4	IVT 7.13	bin\13.4\nt\ivt.exe
nt64	ISE 13.4	IVT 7.13	bin\13.4\nt64\ivt.exe
lin	ISE 13.4	IVT 7.13	bin/13.4/lin/ivt
lin64	ISE 13.4	IVT 7.13	bin/13.4/lin64/ivt
nt	ISE 14.1	IVT 7.13	bin\14.1\nt\ivt.exe
nt64	ISE 14.1	IVT 7.13	bin\14.1\nt64\ivt.exe
lin	ISE 14.1	IVT 7.13	bin/14.1/lin/ivt
lin64	ISE 14.1	IVT 7.13	bin/14.1/lin64/ivt

Table 5 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 7.13 Note 2 IVT 7.13 improves the handling of large blocks in Spartan-6 such as GTPA1_DUAL and PCIE. These blocks have not been shown to provide isolation and are therefore prohibited for use as a fence. Previously IVT did not report an isolation violation for designs with multiple isolation groups abutting a large block.

IVT 7.13 Note 3 In UCF mode, IVT now correctly identifies area range constraints that would permit DSPs from two isolation groups to be placed without adequate vertical separation.

IVT 7.13 Note 4 Support for 7 series devices is under development but not ready for production use.

IVT 7.08 Note 1 IVT 7.08 is nearly identical to IVT 6.48. The purpose of the release is to address a few remaining items noted in independent review. There are two small documentation changes. One default case in a conditional was made explicit.

IVT 7.08 Note 2 IVT 7.08 requires ISE 12.4, ISE 13.1, ISE 13.2, or ISE 13.3 to be installed as the current version of ISE. See IVT 6.48 Note 1 below.

IVT 7.08 Note 3 IVT is not available for the Linux 32-bit platform for ISE 12.4 and ISE 13.1 due to unresolved build issues.

IVT 6.48 Note 1 IVT 6.48 requires ISE 12.4, ISE 13.1, ISE 13.2, or ISE 13.3 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
nt64 Microsoft Windows NT and later 64-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.4	IVT 6.48	bin\12.4\nt\ivt.exe
nt64	ISE 12.4	IVT 6.48	bin\12.4\nt\ivt.exe
lin64	ISE 12.4	IVT 6.48	bin/12.4/lin64/ivt
nt	ISE 13.1	IVT 6.48	bin\13.1\nt\ivt.exe
nt64	ISE 13.1	IVT 6.48	bin\13.1\nt64\ivt.exe
lin64	ISE 13.1	IVT 6.48	bin/13.1/lin64/ivt
nt	ISE 13.2	IVT 6.48	bin\13.2\nt\ivt.exe
nt64	ISE 13.2	IVT 6.48	bin\13.2\nt64\ivt.exe
lin	ISE 13.2	IVT 6.48	bin/13.2/lin/ivt
lin64	ISE 13.2	IVT 6.48	bin/13.2/lin64/ivt
nt	ISE 13.3	IVT 6.48	bin\13.3\nt\ivt.exe
nt64	ISE 13.3	IVT 6.48	bin\13.3\nt64\ivt.exe
lin	ISE 13.3	IVT 6.48	bin/13.3/lin/ivt
lin64	ISE 13.3	IVT 6.48	bin/13.3/lin64/ivt

Table 6 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 6.48 Note 2 Duplicate tile adjacency violation reports have been eliminated.

IVT 6.48 Note 3 The following architectures are supported:

Automotive Spartan6
Automotive Virtex4

Space-Grade Virtex-4QV
 Defense-Grade Spartan-6Q
 Defense-Grade Spartan-6Q Lower Power
 Defense-Grade Virtex-4Q
 Defense-Grade Virtex-5Q
 Spartan6
 Spartan6 Lower Power
 Virtex4
 Virtex5

IVT 6.48 Note 4 Area ranges defined in non-canonical form are now supported. Previously, only area ranges defined by the lower left corner and the upper right corner were rendered correctly. Ranges defined by the lower right corner and upper left corner were rendered as either a heavy horizontal line or a heavy vertical line.

IVT 6.48 Note 5 Nets driven by regional clock buffers are now excluded from the check for PIPs in the fence.

IVT 6.48 Note 6 During Xilinx testing, the Virtex-5 wire segment NR5BEG2 appeared to produce a spurious error in a test design. At the time, we did not realize that the test was invalid. Analysis of the Virtex-5 routing schematics showed this wire could not result in an isolation violation, so a special case was added to IVT to ignore this wire. Later, when we realized the test case was not valid, we removed the special case.

IVT 6.47 Note 1 IVT 6.47 requires ISE 12.4 or ISE 13.1 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
 nt64 Microsoft Windows NT and later 64-bit operating systems,
 lin Red Hat Linux 32-bit operating system, and
 lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.4	IVT 6.47	bin\12.4\nt\ivt.exe
nt64	ISE 12.4	IVT 6.47	bin\12.4\nt\ivt.exe
lin	ISE 12.4	IVT 6.47	bin/12.4/lin/ivt
lin64	ISE 12.4	IVT 6.47	bin/12.4/lin64/ivt
nt	ISE 13.1	IVT 6.47	bin\13.1\nt\ivt.exe
nt64	ISE 13.1	IVT 6.47	bin\13.1\nt64\ivt.exe
lin	ISE 13.1	IVT 6.47	bin/13.1/lin/ivt
lin64	ISE 13.1	IVT 6.47	bin/13.1/lin64/ivt

Table 1 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 6.47 Note 2 IVT 6.38 and earlier releases would incorrectly reject designs targeting low-power, space, and automotive variants of supported devices. Disclaimer: the fact that IVT runs on a particular device is not an indication that the device has been approved for any and all applications.

IVT 6.47 Note 3 A valid fence tile must meet certain conditions. It must be free of isolated logic and routing. Any global routing it contains must be free of interconnection points, except for clock routing. Previously IVT would not detect gaps in the fence composed of more than one invalid fence tile. For example, if the NCD file were incorrectly generated to activate arithmetic carry chain routing activated in two vertically adjacent tiles between two isolated regions, IVT would not report an isolation violation. Now, IVT propagates isolation information to all invalid fence tiles connected to an isolated region. Although strictly speaking, this was a defect in IVT, it is unlikely to affect production designs because it would require a defect in ISE likely to be observed as a result of Xilinx internal testing; or deliberate modification of the NCD file in FPGA Editor.

Because IVT propagates information to all adjoining invalid fence tiles, many more tiles may be marked with an × than in previous versions of IVT.

IVT 6.47 Note 4 UCF mode area range separation calculations in the output report were incorrect. This was apparent in the SVG diagrams. To account for special cases in the isolation floorplanning rules, the area range separation calculations are now performed using the same code as NCD mode. For the purpose of analysis, IVT treats every tile enclosed by an isolated area range as occupied. IVT now draws an × on any tile that could participate in isolation violations with the given area range constraints.

Caution! Since this defect could result in an underestimate of the isolation strength of a design, the UCF mode area range separation analysis in reports from versions of IVT prior to 6.47 should be considered invalid.

IVT 6.47 Note 5 In the NCD mode floorplan tile diagram, IVT now renders tiles occupied by multiple isolation groups in orange. Previously, IVT used bright red, but the shade of red was not sufficiently different from shades of red used for isolated regions. These tiles are also marked with an ×.

IVT 6.47 Note 6 IVT now supports UCF files containing hierarchical paths in the pin isolation group file. An overly restrictive regular expression excluded the forward slash character since it is part of a C-style block comment delimiter.

IVT 6.47 Note 7 IVT no longer generates a warning about the OFFSET constraint.

IVT 6.47 Note 8 The IVT output report sections “Package Pins, I/O Buffers, and I/O Banks” and “Area Group Separation” are reported unconditionally. Previously, they were only reported in verbose mode.

IVT 6.47 Note 9 The issue described in **IVT 6.37 Note 9** has been addressed. IVT implements special-case fence rules for sites that occupy more than one tile, including the Spartan-6 DSP site that requires two unused DSP sites to isolated one DSP site from another above it.

IVT 6.47 Note 10 When IVT was run with the -f switch, but no parameter file, IVT would crash; now it issues an appropriate usage error.

IVT 6.47 Note 11 In UCF-mode, the report section Package Pins, I/O Buffers, and I/O Banks is now reported unconditionally. Previously, the section was only reported when the -verbose switch was used.

IVT 6.47 Note 12 IVT now renders occupied logic sites with a thin colored rectangle in the right half of the tile. Some logic sites, such as Block RAM span several tiles vertically.

IVT 6.47 Note 13 In the Pin Isolation Group file, IVT now accepts forward slashes as a net name path delimiter, provided the net name is enclosed in quotes.

IVT 6.47 Note 14 The issue described in **IVT 6.37 Note 12** has been resolved by changing the intent of the section “Tiles in the Fence Containing Programming” to refer only to tiles actually

needed for separating tiles containing isolated routing or logic from distinct isolation groups. The violation text clarifies this:

```
Isolation Violation: 134: The tiles below are used to separate
isolated nets or logic and have not default-configurations.
```

IVT 6.47 Note 15 The issue described in **IVT 6.37 Note 13** has been resolved by changing the title of the section “Tiles Containing Nets But Outside Isolation Group Area Ranges” to “Tiles in the Fence Containing Nets” with the following explanation:

```
The tiles below are in the nominal fence as defined by
the region outside all isolation groups. This list is intended
to aid the user in demonstrating that an actual fence
has been realized.
```

IVT 6.47 Note 16 The issue described in **IVT 6.37 Note 14** has been resolved by changing the intent of the section “Tiles in the Fence Containing Used PIPs” to report isolation violations only. The violation text clarifies this:

```
Isolation Violation:129: The following tiles are configured to
use wires that contain programmable interconnect points (PIPs)
in the fence. Such wires are not allowed. Check that
constraints needed for isolation are present.
```

IVT 6.38 Note 1 IVT 6.38 requires ISE 12.4 or ISE 13.1 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
nt64 Microsoft Windows NT and later 64-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.4	IVT 6.38	bin\12.4\nt\ivt.exe
nt64	ISE 12.4	IVT 6.38	bin\12.4\nt\ivt.exe
lin	ISE 12.4	IVT 6.38	bin/12.4/lin/ivt
lin64	ISE 12.4	IVT 6.38	bin/12.4/lin64/ivt
nt	ISE 13.1	IVT 6.38	bin\13.1\nt\ivt.exe
nt64	ISE 13.1	IVT 6.38	bin\13.1\nt64\ivt.exe
lin	ISE 13.1	IVT 6.38	bin/13.1/lin/ivt
lin64	ISE 13.1	IVT 6.38	bin/13.1/lin64/ivt

Table 2 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 6.38 Note 2 IVT no longer reports distances between area ranges unless the distance is less than the minimum required spacing. Especially for complex designs, the way this information was presented in the IVT output report was not terribly useful and redundant to the area range constraint diagram (SVG file).

IVT 6.38 Note 3 In rare cases, IVT would fail to measure the distance between area range constraints correctly. It did not take into account site types that cannot be used as a fence. This now fixed, however, UCF mode is several times slower as a result.

IVT 6.38 Note 4 Several section headings and other messages were edited to improve the clarity of the output report.

IVT 6.38 Note 5 Due to a typo, the PLL_ADV site and the PPC-related sites were not recognized as suitable fence tiles in the previous release of IVT. This has been fixed.

IVT 6.38 Note 6 Previously, IVT reported all isolated nets that entered the fence area as violations regardless of whether or not a valid fence existed between the isolated nets and other isolated resources. When this was fixed, IVT ceased to report much information about the contents of the fence. IVT now reports the contents of the fence in an advisory manner. Violations are based on actual tile contents, not region boundaries.

IVT 6.38 Note 7 IVT indicates isolation violations in the SVG diagram by drawing an × through the tile or tiles. Previously for adjacent tile violations, IVT only marked one member of the pair. Previously, IVT did not mark tiles needed as fence tiles but containing logic. Both issues are now fixed.

IVT 6.37 Note 1 IVT 6.37 requires ISE 12.4 or ISE 13.1 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.4	IVT 6.37	bin\12.4\nt\ivt.exe
lin	ISE 12.4	IVT 6.37	bin/12.4/lin/ivt
lin64	ISE 12.4	IVT 6.37	bin/12.4/lin64/ivt
nt	ISE 13.1	IVT 6.37	bin\13.1\nt\ivt.exe
lin	ISE 13.1	IVT 6.37	bin/13.1/lin/ivt
lin64	ISE 13.1	IVT 6.37	bin/13.1/lin64/ivt

Table 3 – IVT location by operating system and ISE version.

The input file supplied to IVT must be from the same major release or earlier.

Although it is possible that the IVT executable for a given minor release of ISE may work with other minor releases for the same major release, this configuration is not tested or supported.

IVT 6.37 Note 2 The output report format and terminology have been updated to improve clarity and to make the report easier to navigate with a text editor. All section headings now begin with the word 'Section' followed by the section number. All summary statistics have been moved to the end of the document. The terminology is explained in Table 4 – below.

Old Term	New Term	Rationale
CLB	tile	A broader term is needed now that more area range site types are supported.

Old Term	New Term	Rationale
combined	top-level	Formerly, several partial NCD files and a “combined” NCD file were used to specify isolated modules and complete design information. Now, block names and a single NCD file are used.
combined design	design	When only a single NCD file is specified, there is no reason to refer to it as “combined.”
failing path	net adjacency violation, or net content violation	<p>The term “failing” implies the existence of an actual problem. The term “violation” more accurately indicates that a rule was not followed. Further investigation would be needed to determine if the violation could realistically be exploited.</p> <p>A “failing path” does not represent an actual failure; it is an example of a potential route that demonstrates two nets cannot be proven to be sufficiently isolated from one another.</p>
fault	violation	The term “fault” implies the existence of an actual problem. The term “violation” more accurately indicates that a rule was not followed. Further investigation would be needed to determine if the violation could realistically be exploited.
identified networks	categorized nets	Clarification.
ignored	categorized	The term “ignored” referred to a specific additional analysis that was determined to be unnecessary for the ignored net or pin, etc.
input designs	isolated modules	More specific.
network	net	More familiar usage.
network boundary violation	—	The term “network boundary violation” describes an overly-strict interpretation of the isolation requirements. The code to perform this errant check has been eliminated.
shared	top-level	The term “shared” referred to nets present in more than one partial NCD file formerly used to specify isolation groups. All top-level nets were duplicated in each partial NCD, hence the term “shared.”
tiles in the fence containing networks	tiles containing networks outside isolation group area ranges	The term “fence” is used ambiguously to refer either to the tiles outside all area range constraints that are used to specify isolation groups or tiles that are actually needed to

Old Term	New Term	Rationale
		create a gap between isolated nets and logic.
unidentified shared networks	uncategorized user global nets	Clarification.

Table 4 – Terminology revisions

IVT 6.37 Note 3 Error messages have been divided into several categories to clarify remediation and to distinguish isolation violations from other errors. All isolation violation summary statistics are now reported at the end of the isolation report. The message categories are defined as follows:

Fatal Internal – An assumption in the code was violated and there is no contingency for continuing. Requires investigation by Xilinx personnel.

Fatal Input – The user input is invalid. For example, an input NCD that is not fully routed will produce a fatal input error because the analysis requires a complete design.

Fatal Usage – the user input arguments are not correct. For example, a command line without at least two -group parameters supplied will produce a fatal usage error.

Isolation Violation – the input design violates the FPGA design rules for achieving functional isolation among the given modules. For report sections in which all reported items correspond to violations, a single isolation violation message will appear below the section heading, but the violations will be tallied individually. For other report sections, violations are reported for individual items within the category.

IVT 6.37 Note 4 Fixed a defect regarding the reporting of inter-region signal. Previous versions assumed that all inter-region signals would be at the top level of the design hierarchy. For designs that have isolated modules *not* directly below the top level it is possible for signals to connect isolated modules but not be at the top level.

For example if a design has isolated modules: SIGMA, USER/ALPHA, and USER/BETA, it is possible for a signal USER/A_B defined in the USER block to connect USER/ALPHA to USER/BETA. This signal should be reported as an uncategorized user global net because it connects two isolation groups, however it is not at the top of the design hierarchy. In contrast, the signal A_B defined in the top-level block would be reported correctly.

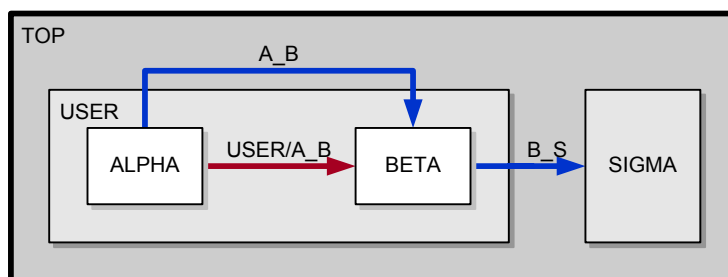


Figure 1 – Block hierarchy showing signal locations within the hierarchy

Support for isolated modules not directly below top was introduced in IVT 5.26 circa March 9, 2010. Guidance for using modules not directly below top as not yet been released, so this defect is very unlikely to affect the analysis of any customer designs.

IVT 6.37 Note 5 Area range constraints for all site types that that are allowed to be used for isolation are fully supported in UCF- as well as NCD-modes. IVT displays these area range constraints in both modes.

The following warning is no longer applicable:

```
Warning:48: Only area range constraints expressed in slices
(e.g. SLICE_X0Y110:SLICE_X1Y127) are automatically verified
at this time. It is incumbent on the user to verify that
other area ranges are correct.
```

However, the isolation analysis related to area ranges has changed. See the next note.

IVT 6.37 Note 6 Isolation analysis no longer assumes that area range constraints used to define isolation groups must be strictly followed by the routing. Isolated nets may exist outside all area range constraints used to define isolation groups. Isolation violations are reported for tiles implementing nets or logic from multiple isolation groups as defined by the logical design hierarchy. Isolation violations are also reported for pairs of adjacent tiles implementing nets of logic from multiple isolation groups.

IVT 6.37 Note 7 Inter-region signals are prohibited from having loads in more than one isolated region. IVT now reports violations of this requirement.

IVT 6.37 Note 8 Fixed a defect in the identification of clock buffers. Previously, BUFG, DCM, and PLL primitives were identified, but variants such as BUFGMUX and DCM_ADV were not. The consequences of this defect were minor: typically a small number of nets that should have been categorized as driven by clocks were instead left uncategorized.

IVT 6.37 Note 9 This release of IVT does not implement special-case fence rules for sites such as BRAM, DCM, and DSP. This will be addressed in a future release.

IVT 6.37 Note 10 Fixed a crash that would occur at exit after IVT reported a fatal input error, stemming from a duplicate request to free memory.

IVT 6.37 Note 11 Improved the discrimination of tile types so that the tile diagrams output by IVT have a one-to-one correspondence with interconnect tiles that can be used as fence tiles. Previously, tile diagrams would display some internal tiles not relevant to isolation analysis, such as certain interface tiles and clock spline tiles.

IVT 6.37 Note 12 The section entitled, “Tiles in the Fence Containing Programming” does not display information about all tiles outside all isolation groups. Currently it only displays information about tiles that are adjacent to at least two tiles containing nets from distinct isolation groups. This will be corrected to match the behavior described in the report in a future release.

IVT 6.37 Note 13 The section entitled, “Tiles Containing Nets But Outside Isolation Group Area Ranges” does not display information about all tiles outside all isolation groups. Currently it only displays information about tiles that are adjacent to at least two tiles containing nets from distinct isolation groups. This will be corrected to match the behavior described in the report in a future release.

IVT 6.37 Note 14 The section entitled, “Tiles in the Fence Containing Used PIPs” does not display information about all tiles outside all isolation groups. Currently it only displays information about tiles that are adjacent to at least two tiles containing nets from distinct isolation groups. This will be corrected to match the behavior described in the report in a future release.

IVT 5.35 Note 1 IVT 5.35 requires ISE 12.1 or ISE 12.2 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt	Microsoft Windows NT and later 32-bit operating systems,
lin	Red Hat Linux 32-bit operating system, and
lin64	Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.1	IVT 5.35	bin\12.1\nt\ivt.exe
lin	ISE 12.1	IVT 5.35	bin/12.1/lin/ivt
lin64	ISE 12.1	IVT 5.35	bin/12.1/lin64/ivt

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 12.2	IVT 5.35	bin\12.2\nt\ivt.exe
lin	ISE 12.2	IVT 5.35	bin/12.2/lin/ivt
lin64	ISE 12.2	IVT 5.35	bin/12.2/lin64/ivt

Table 5 – IVT location by operating system and ISE version.

IVT 5.34 Note 1 IVT 5.34 requires ISE 11.4 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. This is a patch release. In the interest of expedience, support for ISE 11.5 and support for Microsoft 64-bit operating systems is not provided in this release. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 11.4	IVT 5.34	bin\11.4\nt\ivt.exe
lin	ISE 11.4	IVT 5.34	bin/11.4/lin/ivt
lin64	ISE 11.4	IVT 5.34	bin/11.4/lin64/ivt

Table 6 – IVT location by operating system and ISE version.

IVT 5.34 Note 2 Fixes a defect in the command line argument validation for modules not directly below top. Some designs would mistakenly be rejected with a message of the form:

```
Error:74: 'module_a/block_a1' is not a module name in foo.ncd.
The modules found were:
module_a, module_a/block_a1, module_b, module_c
```

IVT 5.33 Note 1 IVT 5.33 requires ISE 11.3 or ISE 11.4 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. This release is intended to help a customer with a Virtex-4 issue. In the interest of expedience, support for ISE 11.5 and support for Microsoft 64-bit operating systems is not provided in this release. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 11.3	IVT 5.33	bin\11.3\nt\ivt.exe
lin	ISE 11.3	IVT 5.33	bin/11.3/lin/ivt
lin64	ISE 11.3	IVT 5.33	bin/11.3/lin64/ivt
nt	ISE 11.4	IVT 5.33	bin\11.4\nt\ivt.exe

OS Platform	ISE Version	IVT Version	Archive Path
lin	ISE 11.4	IVT 5.33	bin/11.4/lin/ivt
lin64	ISE 11.4	IVT 5.33	bin/11.4/lin64/ivt

Table 7 – IVT location by operating system and ISE version.

IVT 5.33 Note 2 The number of wire pairs for which fault costs have been defined has increased. This was in response to a customer design that exposed gaps in the cost function from previous versions of IVT. In some cases, the IVT runtime may increase due to additional time evaluating the cost function. These additional costs have been reviewed by NSA and CESG. The details of the new costs will be presented in an upcoming revision to the Virtex-4 Failure Analysis RPT059.

IVT 5.33 Note 3 IVT 5.31 incorrectly returned an exit code of zero for designs with unrouted nets but no other errors.

IVT 5.31 Note 1 IVT 5.31 requires ISE 11.4 or ISE 11.5 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 11.4	IVT 5.31	bin\11.4\nt\ivt.exe
nt64	ISE 11.4	IVT 5.31	bin\11.4\nt64\ivt.exe
lin	ISE 11.4	IVT 5.31	bin/11.4/lin/ivt
lin64	ISE 11.4	IVT 5.31	bin/11.4/lin64/ivt
nt	ISE 11.5	IVT 5.31	bin\11.5\nt\ivt.exe
nt64	ISE 11.5	IVT 5.31	bin\11.5\nt64\ivt.exe
lin	ISE 11.5	IVT 5.31	bin/11.5/lin/ivt
lin64	ISE 11.5	IVT 5.31	bin/11.5/lin64/ivt

Table 8 – IVT location by operating system and ISE version.

IVT 5.31 Note 2 Repaired support for isolated modules not directly below top. In NCD mode, the -group switch now a hierarchical path such as user/block1. Overlapping groups are not allowed.

IVT 5.31 Note 3 In tile mode, in addition to reporting tiles that are in the fence, tiles containing isolated networks that lack a fence, and tiles containing isolated networks from multiple isolation groups, IVT now reports tiles that contain isolated networks that are located outside the area range constraints associated with the isolated networks.

IVT 5.31 Note 4 In tile mode, IVT reports isolated networks that enter any isolation region other than their own.

IVT 5.31 Note 5 The presence of unrouted nets has been upgraded from a warning to an error. All analysis is preformed as in previous versions, but the exit status is non-zero and the total number of errors includes the number of unrouted nets.

IVT 5.31 Note 6 During IVT tile mode analysis, periods are now printed to the console to indicate activity.

IVT 5.31 Note 7 The notation in the SVG diagrams has changed slightly. The presence of global signals is now indicated by an inner border and the presence of networks from multiple isolation groups in a tile is now indicated both by a bright red background and by a large X through the tile.

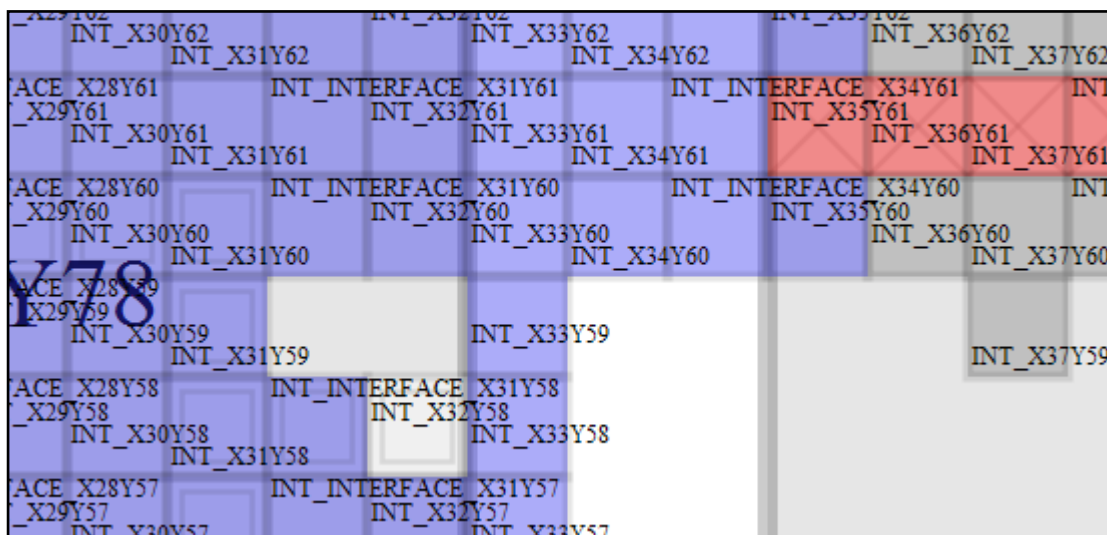


Table 9 – IVT Scalable Vector Graphics (SVG) output showing tiles containing global networks with an inner border and tiles containing isolated networks from multiple isolation groups with a bright red background and marked with an X.

IVT 5.26 Note 2 IVT 5.26 requires ISE 11.4 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

- nt Microsoft Windows NT and later 32-bit operating systems,
- nt64 Microsoft Windows NT and later 64-bit operating systems,
- lin Red Hat Linux 32-bit operating system, and
- lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 11.4	IVT 5.26	bin\11.4\nt\ivt.exe
nt64	ISE 11.4	IVT 5.26	bin\11.4\nt64\ivt.exe
lin	ISE 11.4	IVT 5.26	bin/11.4/lin/ivt
lin64	ISE 11.4	IVT 5.26	bin/11.4/lin64/ivt

Table 10 – IVT location by operating system and ISE version.

IVT 5.26 Note 2 Added support for isolated modules not directly below top. In NCD mode, the -group switch now a hierarchical path such as user/block1. Overlapping groups are not allowed.

IVT 5.26 Note 3 Fixed a command line argument processing error in UCF mode. Previously a misspelled device name could cause IVT to exit without an informative error message.

IVT 5.26 Note 4 IVT incorrectly assumed that pin enumerations would not contain duplicates. When this assumption was violated, IVT would exit with an uninformative error. Now IVT prints a warning, ignores the duplicate and continues. The warning reads as follows:

```
Warning:108: The pin below was listed more than once in the NCD
file.
```

or

```
Warning:109: The I/O buffer below was listed more than once in the
NCD file.
```

IVT 5.26 Note 5 The copyright notice was updated to 2006-2010.

IVT 5.20 Note 1 IVT 5.20 requires ISE 11.3 or ISE 11.4 to be installed as the current version of ISE. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
nt64 Microsoft Windows NT and later 64-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 11.3	IVT 5.20	bin\11.3\nt\ivt.exe
nt64	ISE 11.3	IVT 5.20	bin\11.3\nt64\ivt.exe
lin	ISE 11.3	IVT 5.20	bin/11.3/lin/ivt
lin64	ISE 11.3	IVT 5.20	bin/11.3/lin64/ivt
nt	ISE 11.4	IVT 5.20	bin\11.4\nt\ivt.exe
nt64	ISE 11.4	IVT 5.20	bin\11.4\nt64\ivt.exe
lin	ISE 11.4	IVT 5.20	bin/11.4/lin/ivt
lin64	ISE 11.4	IVT 5.20	bin/11.4/lin64/ivt

Table 11 – IVT location by operating system and ISE version.

IVT 5.20 Note 2 The IVT output report now identifies the internal build of the ISE libraries for which IVT was compiled and the version of the ISE libraries used to run IVT.

IVT 5.20 Note 3 The group parameter in NCD mode has been generalized to accept the name of a module at any level of hierarchy below top. Previously, only modules directly below top or NCD files were accepted.

IVT 5.20 Note 4 Preliminary support for Spartan-6 has been added.

IVT 5.20 Note 5 I/O buffers that have no associated I/O bank are now reported.

IVT 5.20 Note 6 Tile reporting includes node identifiers to aid examination in FPGA Editor. The node name and node index are reported using the syntax below.

```
<Node:wire_name:node_index>
```

The node can be selected in FPGA Editor by entering the command,

```
select -k wire 'wire_name'
```

into the command line below the array window or as part of an FPGA Editor script. For example,

```
select -k wire 'OMUX(-62279,-67512)'
```

IVT 5.20 Note 7 Added support for single row or column area range constraints.

IVT 5.17 Note 1 Preliminary support for analysis of placed and routed Virtex 5 has been implemented. Virtex-5 and subsequent isolation analysis will be based on analysis of the contents of routing tiles. The device analysis required to justify tile-based isolation analysis is in progress. The routing cost function is no longer used for Virtex-5. Both routing-based analysis and tile-based analysis are performed for Virtex-4. IVT 5.17 requires Xilinx ISE 11.1 or ISE 11.2.

IVT 5.17 Note 2 Preliminary support for generating isolation diagrams has been added. In addition to a textual output report, IVT generates a Scaleable Vector Graphics (SVG) file showing the interconnect tiles in the device color coded based on the signals they contain. SVG is a language for describing two-dimensional graphics and graphical applications in XML. SVG can be displayed in Mozilla Firefox and can be edited in Microsoft Visio, among others.

IVT 5.17 Note 3 Fixed a UCF parsing error. IVT parses inline comments incorrectly. When there was more than one space or tab between the end of the previous statement and the start of the inline comment, IVT would truncate the beginning of the next statement. This would normally result in a syntax error; however it would be possible to construct a UCF file in which this error would cause statements to be skipped.

IVT 5.17 Note 4 Fixed an error in network categorization. Formerly networks reported as inside a Trusted Bus Macro also included networks attached to a Trusted Bus Macro. Both categories are considered “shared” therefore this change does not change the pass/fail status of any designs.

IVT 5.17 Note 5 Failure is now reported to the console. Previously only success was reported to the console. Failure needed to be inferred from the exit status; an error message; or the absence of the “SUCCESS!” message.

IVT 4.31/5.13 Note 1 IVT 4.31 is intended to be the last release to support ISE 9.4.02. This release coincides with the first official release to support ISE 11.1 and ISE 11.2. With three ISE releases and four platforms supported there are twelve executables herein. All executables are built from a single source. The executables are organized into folders by ISE version and then by platform. The platforms are abbreviated as follows:

nt Microsoft Windows NT and later 32-bit operating systems,
nt64 Microsoft Windows NT and later 64-bit operating systems,
lin Red Hat Linux 32-bit operating system, and
lin64 Red Hat Linux 64-bit operating system.

OS Platform	ISE Version	IVT Version	Archive Path
nt	ISE 9.4.02_PR13	IVT 4.31	bin\9.4.02_PR13\nt\ivt.exe
nt64	ISE 9.4.02_PR13	IVT 4.31	bin\9.4.02_PR13\nt64\ivt.exe
lin	ISE 11.1	IVT 5.13	bin/11.1/lin/ivt
lin64	ISE 11.1	IVT 5.13	bin/11.1/lin64/ivt
lin	ISE 11.2	IVT 5.13	bin/11.2/lin/ivt

OS Platform	ISE Version	IVT Version	Archive Path
lin64	ISE 11.2	IVT 5.13	bin/11.2/lin64/ivt

Table 1 – IVT location by operating system and ISE version.

IVT 4.31/5.13 Note 2 Virtex-5 UCF-mode is supported. Virtex-5 NCD-mode is still under development and IVT 4.2 Note 1 below still applies.

IVT 4.31/5.13 Note 3 The number of wire pairs for which fault costs have been defined has increased. This was in response to customer designs and new test designs that exposed gaps in the cost function from previous versions of IVT. In some cases, the IVT runtime may increase due to additional time evaluating the cost function. The details of the new costs have been added to the Virtex-4 Failure Analysis RPT059.

IVT 4.29 Note 1 Area range constraints are reported in NCD-mode.

IVT 4.29 Note 2 Trusted Bus Macros are listed in greater detail in NCD-mode. Networks attached to bus macros are listed along with the macro pin and isolation group of the network. Note that networks reported in group “combined” are defined at the top level and are not confined to a single isolated region.

IVT 4.29 Note 3 Networks driven by global clocks are now reported.

IVT 4.29 Note 4 In UCF-mode, more syntactic options are supported for instance and network names. Quotation marks are optional. In addition to double quotes, single quotes and accent graves (backquotes), may be used.

IVT 4.29 Note 5 In UCF-mode, IVT no longer generates errors for CONFIG PROHIBIT constraints. In addition, IVT has better support for reporting constraint parsing errors.

IVT 4.29 Note 6 The supported operating system platforms are now 32- and 64-bit Microsoft Windows XP and Red Hat Linux. See Installation Instructions on page 26 below for the complete list of supported platforms.

IVT 4.17 Note 1 The number of wire pairs for which fault costs have been defined has increased. This was in response to customer designs and new test designs that exposed gaps in the cost function from previous versions of IVT. In some cases, the IVT runtime may increase due to additional time evaluating the cost function. These additional costs have been reviewed by NSA and CESG. The details of the new costs will be presented in an upcoming revision to the Virtex-4 Failure Analysis RPT059.

IVT 4.15 Note 1 Adjacent even/odd pairs of I/O buffers share a switch box, therefore the requirement that I/O buffers from distinct isolation groups not be adjacent must be treated differently than originally thought. A difference of 1 in Y-coordinate is not sufficient to guarantee the requirement is met. Two I/O buffers from distinct isolation groups must be separated by at least 4 if the lesser Y-coordinate is even, and separated by at least 3 if the lesser Y-coordinate is odd. In the example below, IOB_X0Y0 is now considered adjacent to IOB_X0Y1, IOB_X0Y2, and IOB_X0Y3. Likewise, IOB_X0Y1 is adjacent to IOB_X0Y0, IOB_X0Y2, and IOB_X0Y3.

I/O Buffer	Switch Box
IOB_X0Y5	Red Switch Box
IOB_X0Y4	
IOB_X0Y3	Unused Switch Box
IOB_X0Y2	
IOB_X0Y1	Black Switch Box
IOB_X0Y0	

Table 2 – I/O Buffer adjacency means adjacency of I/O buffer switch boxes.

Since this defect can result in an underestimate of the isolation strength of a design, the UCF analysis and the NCD analysis of I/O buffers (die pins) from versions of IVT prior to 4.15 should be reexamined. Note, the Xilinx floorplanning tools do not allow pin assignments that would have this problem; this situation could only arise through manual editing of the UCF.

IVT 4.15 Note 2 The default value for the -faults command line switch has been reduced from 3 to 2. This is a relaxation of the network isolation requirement as addressed by IVT. The overall FSDA system requirement remains unchanged.

IVT 4.15 Note 3 The cost of a signal getting on an unused BYP_INT in the reverse direction was incorrect. It has been decreased from 2 to 1. Due to the relaxation of the network isolation requirement, this error is not expected to invalidate any previous IVT results.

IVT 4.15 Note 4 Updated UCF parsing to accept additional constraints related to new constraints for partial reconfiguration. Constraints now parsed are all of the following

```
AREA_GROUP "name" PRIVATE=PLACED;
AREA_GROUP "name" CONTAINED=ROUTE;
AREA_GROUP "name" BOUNDARYCROSS=NO;
```

IVT 4.15 Note 5 Updated UCF parsing to be less strict regarding area group naming. It is no longer required to surround the area group name with quotes, though it is recommended to do so.

```
AREA_GROUP name ...;
```

IVT 4.15 Note 6 Updated UCF parsing to be less strict regarding instance locate constraints. IVT now accepts slice ranges for instance locations such as the following.

```
INST "name" LOC="SLICE_XnYm:SLICE_XrYs";
```

IVT 4.15 Note 7 Area range constraints associated with isolation groups are now checked more strictly: the lessor X- and Y-coordinates must be even; and the greater X- and Y-coordinates must be odd.

IVT 4.15 Note 8 Added -allpaths command line switch to aid data gathering related to gaps in the cost function. This option can dramatically increase the size of the output file.

IVT 4.15 Note 9 The number of wire pairs for which fault costs have been defined has roughly doubled. This was in response to customer designs and new test designs that exposed gaps in the cost function from previous versions of IVT. In some cases, the IVT runtime may increase due to additional time evaluating the cost function. These additional costs have been reviewed by NSA and CESG. The details of the new costs will be presented in an upcoming revision to the Virtex-4 Failure Analysis RPT059.

IVT 4.2 Note 1 Added preliminary support for Xilinx Virtex-5 devices. This feature is not ready for customer use. Virtex-5 designs are expected to produce many false isolation failures at this stage of development due to the incompleteness of the routing cost function.

IVT 4.2 Note 2 Added Linux 32-bit and Linux 64-bit executables to the release.

IVT 4.2 Note 3 Updated UCF parsing to accept additional constraints related to area range constraints for partial reconfiguration. Constraints now parsed are all of the following

```
AREA_GROUP "name" ROUTING=CONTAINED;
```

IVT 4.2 Note 4 Fixed NCD processing for multiple NCD-style arguments. Previously EDK projects were incorrectly generating the following error:

```
Error:72: group NCD file design.ncd has more
than one implemented block below top.
An NCD file that defines an isolation group can not be
merged nor complete. Consider supplying the module name
instead
```

IVT 4.2 Note 5 Fixed two defects in the search procedure for routing isolation violations. One defect was that networks with only one node were not considered. The other defect was that an extra node was included at the end of a path. In some cases these defects caused isolation violations to be undetected.

Caution! Since this defect can result in an underestimate of the isolation strength of a design, the network analysis from versions of IVT prior to 4.2 should be considered invalid.

IVT 3.8 Note 1 In NCD mode, the -group parameter will now accept names of blocks directly below the top level instead of paths to module NCD files. This is essential for the ISO flow since module NCD files are no longer generated by the implementation tools.

IVT 3.8 Note 2 In NCD mode, the -group parameter will now accept names of blocks directly below the top level instead of paths to module NCD files. This is essential for the ISO flow since module NCD files are no longer generated by the implementation tools.

IVT 3.8 Note 3 Designs that use RocketIO™ GTX transceivers are supported.

IVT 3.8 Note 4 Several additions have been made to the cost function to address false isolation failures.

- Added cost for BOUNCE to GCLK wires.
- Added cost for BOUNCE to RCLK wires.
- Added cost for HCLK_LEAF_RCLK[01] to HCLK_LEAF_RCLK1.
- Nets driven by BUFR primitives are now considered clock nets and reported as such.

IVT 3.8 Note 5 Improved messages for nets in group NCD files, but missing from the combined design. Now all such nets are listed organized by file and by reason for considering them exempt from further isolation analysis. A note explains that these nets do not appear in the final design and suggests they can arise from supplying group NCD files unrelated to the combined design.

Network classification tests were reordered so that GLOBAL_LOGIC1 and GLOBAL_LOGIC0 are classified as power and ground. Absence of driver or loads are no longer reasons to ignore a net, however warnings are issued in these cases.

IVT 3.8 Note 6 Added -version command line argument. The -version argument causes IVT to print the version number only and exit.

IVT 3.8 Note 7 Updated UCF parsing to accept additional constraints related to area range constraints for partial reconfiguration. Constraints now parsed are all of the following

```
AREA_GROUP "name" MODE=RECONFIG;
AREA_GROUP "name" ROUTING=EXPAND/NO;
AREA_GROUP "name" ROUTING=NOBOUNDARYCROSS;
AREA_GROUP "name" PLACE=RANGE/range;
```

IVT 3.8 Note 8 When a fatal error was detected during command line argument processing before the output report header information was written, IVT would report the error and exit without printing the report header. This made it inconvenient to debug command line argument errors in automated tests.

IVT 2.12 Note 1 Added support for isolation of the static region.

IVT 2.11 Note 1 Several costs implemented previously in IVT were not documented in Virtex-4 Failure Analysis RPT059 (v1.0) dated May 9, 2007. Those costs have been removed so that the IVT implementation matches RPT059.

IVT 2.11 Note 2 The second sentence of IVT 2.10 Note 3 is incorrect. It should have read, "Increased the cost of getting off a wire with type code OMUX, DOUBLE, HUNIHUX, VUNIHUX *and onto BEST_LOGIC_OUTS(0:7)* to 100 because it requires going backwards through a driver." This cost has since been revised down from 100 to 4. For a detailed explanation of the IVT cost function please refer to Virtex-4 Failure Analysis RPT059 (v1.0) dated May 9, 2007.

IVT 2.10 Note 1 Many error messages were supplemented with suggestions for addressing the error.

IVT 2.10 Note 2 Updated the logic for identifying clock networks automatically inserted to avoid Negative Bias Temperature Instability. (See Negative-Bias Temperature Instability (NBTI) Effects in 90 nm PMOS by Austin Lesea and Andrew Percey <http://www.xilinx.com/bvdocs/whitepapers/wp224.pdf> for background on this issue). Previously not all of the automatically inserted networks were identified as being associated with the Xilinx NBTI solution.

IVT 2.10 Note 3 Reduced cost of traversing from IMUX.* wires to BEST_LOGIC_OUTS(0:7) to 3. Increased the cost of getting off a wire with type code OMUX, DOUBLE, HUNIHUX, VUNIHUX to 100 because it requires going backwards through a driver.

IVT 2.9 Note 1 One of the costs resulting from analysis mentioned in IVT 2.8 Note 1 below was inadvertently omitted. This resulted in apparent isolation failures. The omitted cost resolved all of the apparent failures.

IVT 2.8 Note 1 The cost function is sparse with respect to the types of wires. A non-zero cost is only assigned for pairs of wire types that have been exhaustively analyzed. After the defect described in IVT 2.7 Note 1 below was repaired, additional apparent isolation failures appeared in a test design. Additional routing analysis was performed and additional costs were assigned.

IVT 2.7 Note 1 Repaired a defect in the cost function. The cost of a path is the minimum number of failures required to potentially leak information from one isolated region to another. It is not symmetric with respect to the types of the source and destination wires. Several places in the code did not respect the prevailing direction a wire-to-wire connection was used in a path. This led to incorrect path failure cost analysis.

Caution! Since this defect can result in an underestimate of the isolation strength of a design, the network analysis from versions of IVT prior to 2.7 should be considered invalid.

IVT 2.6 Note 1 An area group constraint can be defined with more than one area range constraint. In previous versions of IVT, when area range error was reported, IVT did not indicate which range constraints were involved, however it did print the first area range for each area group. This may have been confusing, since the ranges listed in the error may not be the faulty ones. For example,

```
Error:63:Isolation groups Red and Black are 0 CLBs apart.  
  <AREA_GROUP "pblock_RED" RANGE=SLICE_X42Y96:SLICE_X53Y159,...>  
  [(13)]  
  <AREA_GROUP "pblock_BLACK"  
  RANGE=SLICE_X62Y130:SLICE_X85Y159,...> [(2)]
```

indicates a conflict between area group pblock_RED and pblock_BLACK, but the conflict does not involve the first range of each. Now, IVT lists the specific ranges that conflict.

IVT 2.5 Note 1 More informative messages are issued for errors in the pin isolation groups (PIG) file.

IVT 2.3 Note 1 Fatal error messages are now prefixed with the word "Error".

IVT 2.3 Note 2 If a UCF file contained area groups that were not related to isolation analysis, IVT would analyze them anyway, but they would not have an associated isolation group. This led to nonsense output. Now, a warning is printed about area groups that have no associated isolation group. Only area groups with isolation groups are compared for isolation.

IVT 2.3 Note 3 If an isolation group has no associated area groups, a warning such as,

```
Warning:66: No range constraint was found for area group  
pblock_inst_module_a.
```

is printed.

IVT 2.3 Note 4 If an area group is used for more than one isolation group, IVT now issues a fatal error.

IVT 2.3 Note 5 The copyright notice was updated to 2006-2007.

IVT 2.2a Note 1 Previously the IVT software would generate an error for UCF constraints of the form

```
AREA_GROUP "group_name" PLACE=EXPAND/NO;
```

Now, the IVT software ignores these constraints.

IVT 2.0 Note 1 The formula for converting slices to CLBs was corrected. In prior releases, the value was incorrectly rounded upwards.

IVT 2.0 Note 2 IVT reports that no I/O or pin checking will be performed when a UCF file is supplied, but no PIG file is supplied.

IVT 1.33 Note 1 Initial release.

Known Issues

There are no known issues at this time.

System Requirements

The Xilinx Isolation Verification Tool software requires Xilinx ISE® Integrated Software Environment (ISE) releases 13.4 through 14.7. IVT supports all the platforms supported by ISE. If the corresponding version of ISE is not installed, please refer to the ISE Design Suite 14: Installation, Licensing, and Release Notes UG631 (v 14.5) March 1820, 2013 (http://www.xilinx.com/support/documentation/sw_manuals/xilinx14_5/irn.pdf).

Installation Instructions

The Isolation Verification Tool software is a command line executable. The executable requires dynamic link libraries from the corresponding version of the ISE software to be installed and in the search path.

Microsoft Windows

Windows XP Professional (32-bit and 64-bit)

Windows 7 Professional (32-bit and 64-bit)

Windows Server 2008 (64-bit)

The easiest way to install ivt is to copy the ivt.exe executable to the directory containing other Xilinx executables and dynamic link libraries.

1. Copy the file ivt.exe to the directory containing the Xilinx ISE Software executable files such as ise.exe. Typically, this directory is C:\xilinx\bin\nt\.
2. Verify that ivt.exe is correctly installed. Open a command prompt window. Type,

```
ivt
```

If IVT is correctly installed, a usage message will appear:

```
Xilinx Isolation Verification Tool 7.43
```

```
Copyright (C) 2006-2015 Xilinx, Inc. All rights reserved.  
'ivt -h' displays a brief argument summary.  
'ivt -license' displays the license agreement.
```

If the ISE dynamic link libraries cannot be found, an error dialog will appear:



Figure 1 – Incorrect PATH Environment Variable Setting

If the directory containing the IVT executable is not listed in the PATH environment variable, the following message will be displayed:

```
'ivt' is not recognized as an internal or external command,  
operable program or batch file.
```

Note: If it is desirable to separate the IVT executable from the ISE installation, then the PATH environment variable must list the ISE installation executable directory. It may be convenient to use the XILINX environment variable to specify the executable directory as %XILINX%\bin\nt.

Linux (32- and 64-bit)

Red Hat Enterprise Workstation 5 (32-bit and 64-bit)

Red Hat Enterprise Workstation 6 (32-bit and 64-bit)

SUSE Linux Enterprise 11 (32-bit and 64-bit)

The easiest way to install ivt is to copy the ivt executable to the directory containing other Xilinx executables and dynamic link libraries.

1. Copy the file ivt to the directory containing the Xilinx ISE Software executable files such as ise. You can find the location of your ISE executables by typing,

```
where par
```

at the command line.

2. Verify that ivt is correctly installed. Open a terminal window. Type,

```
ivt
```

If IVT is correctly installed, a usage message will appear:

```
Xilinx Isolation Verification Tool 7.43
```

```
Copyright (C) 2006-2015 Xilinx, Inc. All rights reserved.
```

```
'ivt -h' displays a brief argument summary.
```

```
'ivt -license' displays the license agreement.
```

If the ISE shared libraries cannot be found, an error message will be printed:

```
./ivt: error while loading shared libraries: libPds_Exception.so:  
cannot open shared object file: No such file or directory
```

If the directory containing the IVT executable is not listed in the PATH environment variable, a message like the following will be displayed:

```
bash: ivt: command not found
```

Note: If it is desirable to separate the IVT executable from the ISE installation, then the PATH environment variable must list the ISE installation executable directory. It may be convenient to use the XILINX environment variable to specify the executable directory as \$XILINX/bin/lin or \$XILINX/bin/lin64.

Software Archive Contents

The ivt_7_43.zip archive contains the following files:

<ul style="list-style-type: none"> doc <ul style="list-style-type: none"> IVT End User License Agreement.pdf ivt_7.43_idd.pdf ivt_7.43_req.pdf ivt_7_43_rn.docx ivt_7.43_svd.pdf ivt_ug_7.43.pdf wp412_IDF_for_Fault_Tolerant_Sys.pdf bin <ul style="list-style-type: none"> 13.4 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> lvt lin64 <ul style="list-style-type: none"> ivt 14.1 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> lvt lin64 <ul style="list-style-type: none"> ivt 14.2 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> lvt lin64 <ul style="list-style-type: none"> lvt 14.3 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> lvt lin64 <ul style="list-style-type: none"> ivt 14.4 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> ivt lin64 <ul style="list-style-type: none"> ivt 14.5 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> ivt lin64 <ul style="list-style-type: none"> ivt 	<ul style="list-style-type: none"> 14.6 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> ivt lin64 <ul style="list-style-type: none"> ivt 14.7 <ul style="list-style-type: none"> nt <ul style="list-style-type: none"> ivt.exe nt64 <ul style="list-style-type: none"> ivt.exe lin <ul style="list-style-type: none"> ivt lin64 <ul style="list-style-type: none"> ivt ivtlab <ul style="list-style-type: none"> index.html ivt.exe <ul style="list-style-type: none"> ncd_fail <ul style="list-style-type: none"> fault1.scr hblack.ncd hred.ncd hsimpleh_n2_0-2.ncd hsimpleh_n2_0-2.gif hsimple_ncd_bad.ivt hsimple_ncd_bad.rpt hsimple_ncd_bad.svg ncd_pass <ul style="list-style-type: none"> hblack.ncd hred.ncd hsimple_ivt_ncd.rpt hsimple_ivt_ncd.svg hsimple.ncd hsimple_ncd.ivt ucf_fail <ul style="list-style-type: none"> smt_bad.pig smt_bad.ucf smt_ivt_ucf_bad.rpt smt_ucf_bad.ivt ucf_pass <ul style="list-style-type: none"> smt_ivt_ucf.rpt smt_ivt_ucf_v.rpt smt.pig smt.ucf smt_ucf.ivt smt_ucf_v.ivt web <ul style="list-style-type: none"> body_bg.jpg contextual_nav.css doc_icon.bmp header_brand.jpg header_footer.css home_arrowV2005.gif ncd_process.gif print.css products_services.css tertiary_nav.css ucf_process.gif ug075.pdf universal.css xc4vfx140ff1517.pkg xlogo_bg.gif
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Refer to the Software Version Description (SVD) for Xilinx Isolation Verification Tool (IVT) (ivt_7.43_svd.pdf) for the list of source files comprising IVT.

Software Documentation

For a quick start at using the IVT software, please review the Isolation Verification Tool (IVT) Lab in the doc directory.

License Agreements and Notices

The IVT software depends upon the Boost libraries. The Boost libraries are distributed under the following license.

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Revision History

The following table shows the revision history for this document.

Date	Version	Revisions
11/17/2006	1.33	Initial production release.
3/23/2007	2.5	See Release Notes section.
4/2/2007	2.5	Noted potential confusion in area range error reporting.
4/15/2007	2.9	Described updates to the cost function.
5/25/2007	2.10	Updated for newer Partial Reconfiguration software and as noted in the Release Notes section.
6/7/2007	2.11	Updated cost function to match RPT059.
7/5/2007	2.12	Added support for isolating the static region.
5/14/2008	3.8	Defined new command line arguments based on a single NCD file. Added MGT support. Updated the cost function to reduce the incidence of false isolation failures.
10/6/2008	4.2	Added preliminary Virtex-5 support. Fixed defects in the routing search procedure. Added Linux support.
2/26/2009	4.15	Updated IOB check. Updated default for -faults parameter. Added costs. Updated UCF parsing. Added -allpaths debugging option.
4/3/2009	4.17	Updated the cost function to reduce the incidence of false isolation failures.
6/2/2009	4.29	Improved reporting of Trusted Bus Macros, area range constraints, and networks driven by global clocks. Added support for 64-bit Windows XP. Fixed a minor defect in UCF parsing.
6/18/2009	4.31/5.13	Updated supported platforms and ISE versions. Added Virtex-5 UCF support. Updated the cost function to reduce the incidence of false isolation failures.
6/29/2009	5.17	Updated supported platforms and ISE versions. Added Virtex-5 NCD preliminary tile-based isolation support.
12/26/2009	5.20	Added preliminary support for Spartan-6 and some minor usability enhancements.
3/9/2010	5.26	Added support for isolated modules not directly below top.
4/5/2010	5.31	Repaired support for isolated modules not directly below top. Added support for ISE 11.5. Improved NCD tile-mode output.
5/12/2010	5.33	Updated the cost function. Fixed a defect in the exit status for input designs that are not fully routed.
6/29/2010	5.34	Fixed a defect with command line argument validation. Fixed a mistake in the Linux installation instructions.
9/13/2010	5.35	Support for ISE 12.1 and ISE 12.2
2/2/2011	6.37	Support for ISE 12.4 and ISE 13.1
5/9/2011	6.44	Repaired area group range checking in UCF mode. Repaired fence checking when the gap in the fence is composed of multiple invalid fence tiles. Various other fixes.
6/16/2011	6.47	Expanded device support. Improved UCF checking. Added DSP special case fence rules for Spartan-6. Various other fixes.

8/4/2011	6.48	Eliminated duplicate tile adjacency error reports. Excluded nets driven by regional clocks from PIP checks.
12/9/2011	7.08	Minor documentation changes.
5/2/2012	7.13	Added support for ISE 14.1. Fixed several defects related to sites of width greater than one tile.
5/15/2013	7.27	Added support for ISE 14.4. Added support for Kintex-7.
7/17/2013	7.40	Added support for ISE 14.5 and 14.6. Added support for Zynq.
12/11/2013	7.41	Removed special-case code related to Zynq PS7 tile that was shown to be redundant. Added preliminary support for ISE 14.7. IVT 7.41 functionality should be identical to IVT 7.40.
12/22/2014	7.43	Repaired a defect in processing module names in NCD mode. Added support for ISE 14.7.