

# Arm® Base Boot Requirements Architecture Compliance

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**User Guide**

**arm**

# Arm® Base Boot Requirements Architecture Compliance

## User Guide

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### Release Information

### Document History

Issue	Date	Confidentiality	Change
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# Preface

This preface introduces the *Arm® Base Boot Requirements Architecture Compliance User Guide*.

It contains the following:

- [About this book on page 6.](#)

## About this book

This book is the user guide for Arm® Base Boot Requirements Architecture Compliance. It provides details on the runtime executable environments such as UEFI SCT, and FWTS.

## Using this book

This book is organized into the following chapters:

### **Chapter 1 Introduction to BBR**

This chapter provides an introduction to BBR and details on the runtime executable environments.

### **Chapter 2 UEFI SCT**

This chapter provides information on UEFI SCT and how it is run.

### **Chapter 3 Firmware Test Suite**

This chapter provides information on FWTS, steps to run, and to build FWTS.

### **Chapter 4 Building UEFI SCT and FWTS**

This chapter provides information on building UEFI SCT and FWTS tests.

### **Appendix A Revisions**

This appendix describes the technical changes between released issues of this book.

## Glossary

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See the [Arm Glossary](#) for more information.

## Typographic conventions

### *italic*

Introduces special terminology, denotes cross-references, and citations.

### **bold**

Highlights interface elements, such as menu names. Denotes signal names. Also used for terms in descriptive lists, where appropriate.

### `monospace`

Denotes text that you can enter at the keyboard, such as commands, file and program names, and source code.

### monospace

Denotes a permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.

### `monospace italic`

Denotes arguments to monospace text where the argument is to be replaced by a specific value.

### `monospace bold`

Denotes language keywords when used outside example code.

### <and>

Encloses replaceable terms for assembler syntax where they appear in code or code fragments. For example:

```
MRC p15, 0, <Rd>, <CRn>, <CRm>, <Opcode_2>
```

#### SMALL CAPITALS

Used in body text for a few terms that have specific technical meanings, that are defined in the *Arm® Glossary*. For example, IMPLEMENTATION DEFINED, IMPLEMENTATION SPECIFIC, UNKNOWN, and UNPREDICTABLE.

## Additional reading

This book contains information that is specific to this product. See the following documents for other relevant information.

### Arm publications

- *Arm® Architecture Reference Manual ARMv8, for Armv8-A architecture profile* (DDI 0487G.a ID011921)
- *Arm® Generic Interrupt Controller Architecture Specification for GIC architecture version 3.0 and version 4.0* (IHI 0069D ID072617)
- *GICv3 and GICv4 Software Overview* (DAI 0492)
- *Arm® Base System Architecture 1.0* (DEN0094A)
- *Arm® Base Boot Requirements* (DEN0044F)

### Other publications

None.

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## Other information

- *Arm® Developer*.
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- *Technical Support*.
- *Arm® Glossary*.

# Chapter 1

## Introduction to BBR

This chapter provides an introduction to BBR and details on the runtime executable environments.

It contains the following sections:

- [1.1 Abbreviations](#) on page 1-9.
- [1.2 About the BBR](#) on page 1-10.



## 1.1 Abbreviations

This section lists the abbreviations used in this document.

**Table 1-1 Abbreviations and expansion**

Abbreviation	Expansion
ACPI	Advanced Configuration and Power Interface
BBR	Base Boot Requirements
BSA	Base System Architecture
DT	Device Tree
EBBR	Embedded Base Boot Requirements
FWTS	Firmware Test Suite
PSCI	Power State Coordination Interface
SCT	Self-Certification Tests
SBBR	Server Base Boot Requirements
SMBIOS	System Management BIOS
SMCCC	Secure Monitor Cell Calling Convention
UEFI	Unified Extensible Firmware Interface

## 1.2 About the BBR

This section provides information on Base Boot Requirements (BBR) and the runtime executable environments.

BBR for boot and runtime services is based on Arm 64-bit architecture, that system software such as operating systems and hypervisors, can rely on.

BBR identifies the Arm and industry-standard firmware interfaces applicable to the Arm 64-bit architecture. It includes the PSCI, SMCCC, UEFI, ACPI, SMBIOS, and DT interfaces. In addition, various recipes are created to accommodate the various operating systems and hypervisors.

The BBR test suites check for compliance against the Server Base Boot Requirements (SBBR) or Embedded Base Boot Requirements (EBBR) specifications. These tests are delivered through two runtime executable environments:

- UEFI SCT
- FWTS

For more information on BBR, see the [BBR specification](#).

## Chapter 2

# UEFI SCT

This chapter provides information on UEFI SCT and how it is run.

It contains the following section:

- [2.1 Introduction to UEFI SCT on page 2-12.](#)

## 2.1 Introduction to UEFI SCT

Unified Extensible Firmware Interface (UEFI) Self-certification Test (SCT) examines the UEFI implementation requirements defined by the BBR recipes that are SBBR or EBBR.

For more information on SCT, see [SCT](#).

This section contains the following subsection:

- [2.1.1 Running UEFI SCT on page 2-12](#).

### 2.1.1 Running UEFI SCT

The UEFI SCTs are built as part of the test suite. The SCT can be run automatically and manually. To skip the automated run of UEFI SCTs, press any key when the following prompt from UEFI shell occurs.

```
Shell > Press any key to stop the UEFI SCT running
```

————— **Note** —————

Set the correct system time before starting SCT.

To run the SCT manually, follow these steps:

1. Change directory to the following SCT directory:

```
Shell > FS(X):>cd EFI\BOOT\bbr\SCT
```

2. Run SBBR or EBBR tests:

```
FS(X):EFI\BOOT\bbr\SCT>SCT -s <ebbr.seq/sbbr.seq>
```

3. Run all the tests:

```
FS(X):EFI\BOOT\bbr\SCT>SCT -a -v
```

You can also select and run tests individually. For more information on running the tests, see [SCT User Guide](#).

For more information on steps to build SCT for SBBR or EBBR recipes, see [Chapter 4 Building UEFI SCT and FWTS on page 4-15](#).

## Chapter 3

# Firmware Test Suite

This chapter provides information on FWTS, steps to run, and to build FWTS.

It contains the following section:

- [3.1 Introduction to FWTS on page 3-14.](#)

## 3.1 Introduction to FWTS

Firmware Test Suite (FWTS) is a package that is hosted by Canonical. It provides tests for Advanced Configuration and Power Interface (ACPI), System Management BIOS (SMBIOS), and UEFI. Several SBBR requirements are tested through FWTS.

For more information on FWTS, see [FWTS](#).

### 3.1.1 Running FWTS

To run FWTS manually, the built image must be first copied to the bin directory Linux file system.

To run FWTS on the Linux prompt, follow these steps:

- For SBBR, use the following command:

```
#/bin/fwts -r stdout -q --sbb esrt uefiboopath
```

- For EBBR, use the following command:

```
#/bin/fwts uefivarinfo esrt uefiboopath uefirtmisc uefirttime uefirtvariable
```

# Chapter 4

## Building UEFI SCT and FWTS

This chapter provides information on building UEFI SCT and FWTS tests.

It contains the following section:

- [4.1 Building UEFI SCT and FWTS on page 4-16.](#)

## 4.1 Building UEFI SCT and FWTS

This section describes how to build UEFI SCT and FWTS for EBBR and SBBR recipes.

The SystemReady ACS live image contains all the BBR ACS tests. However, for debug and verification of bug-fixes, the following steps let you build UEFI SCT and FWTS images independently.

1. Clone BBR repository:

```
git clone https://github.com/ARM-software/bbr-acs
```

2. Get the source code:

```
cd bbr-acs/<ebbr/sbbr>/scripts  
./build-scripts/get_<ebbr/sbbr>_source.sh
```

3. Build BBR ACS from the scripts directory run:

```
./build-scripts/build_<ebbr/sbbr>.sh
```

Patches are applied by the script to the build files to create EBBR or SBBR image.

---

### Note

- The generated image of UEFI SCT is available in `bbr-acs/<ebbr/sbbr>/scripts/edk2-test/uefi-sct/<ARCH>_SCT`. Here, `<ARCH>` is `AARCH64`.
  - The generated image of FWTS can be found in `bbr-acs/<ebbr/sbbr>/scripts/fwts/fwts_output`.
  - In the UEFI application, `CapsuleApp.efi` is available in `bbr-acs/<ebbr/sbbr>/scripts/edk2/Build/MdeModule/DEBUG_GCC5/AARCH64`.
-



# Appendix A

## Revisions

This appendix describes the technical changes between released issues of this book.

It contains the following section:

- [A.1 Revisions on page Appx-A-18.](#)

## A.1 Revisions

This section consists of all the technical changes between different versions of this document.

**Table A-1 Issue 0008-01**

Change	Location
First release	-

**Table A-2 Issue 0008-01 to Issue 0009-02**

Change	Location
Added a note providing location for CapsuleApp.efi.	See <a href="#">4.1 Building UEFI SCT and FWTS on page 4-16.</a>

**Table A-3 Issue 0009-02 to Issue 0100-01**

Change	Location
Updated the commands for SBRR and EBBR to run FWTS on the Linux prompt.	See <a href="#">3.1.1 Running FWTS on page 3-14.</a>