

FR-IMG-001 — Build Virtual Machine Images

[Go to Crucible Image Management Requirements](#)

Statement

[Crucible](#) SHALL build a [Machine Image](#).

Source Statement

The system shall build virtual machine images.

Source

Crucible System Requirements Specification, Version 1.1 Draft, Functional Requirements, FR-IMG-001.

Assessment

The source statement expresses a direct functional behavior but requires normalization of terminology.

The following Specification, Discipline, and Authoring findings apply:

- **The system** does not use the defined system name
- **shall** does not follow the established uppercase normative convention
- **virtual machine images** does not use the defined [Machine Image](#) term
- The source statement does not identify a particular image format, target platform, build tool, or build method
- The source statement does not require image signing, image verification, image promotion, compliance assessment, or deployment

The normalized Statement:

- Replaces **The system** with [Crucible](#)
- Uses the direct and testable verb **build**
- Replaces **virtual machine images** with the defined Machine Image term
- Preserves the implementation independence of the source requirement
- Retains one primary required behavior

The normalized Statement does not add requirements for the contents, format, signing, verification, promotion, compliance, or deployment of the resulting Machine Image. Separate requirements define those obligations.

Rationale

A [Machine Image](#) captures the software, configuration, and other image content required to instantiate a virtual machine.

Building Machine Images through [Crucible](#) allows the Image Management workflow to create image [Artifacts](#) for later verification, signing, promotion, distribution, and deployment.

Machine Image building contributes to:

- Repeatable image creation
- Controlled image content
- Consistent virtual machine instantiation
- Automated image workflows
- [Reproducibility](#)
- [Provenance](#)
- [Traceability](#)

The build operation may consume:

- A [Crucible Description](#)
- One or more [Image Layers](#)
- A selected [Baseline](#)
- Configuration values
- Software packages
- Operating-system content
- Build scripts
- Other controlled input [Artifacts](#)

The applicable architecture and lower-level requirements determine which inputs apply to a particular Machine Image build.

Applies To

This requirement applies to:

- [Crucible](#)
- [Machine Images](#)
- Machine Image builds
- Machine Image build inputs
- Machine Image build outputs
- [Image Layers](#)
- [Baselines](#)
- [Crucible Descriptions](#)
- Build tools
- Build workflows
- Virtual machine platforms
- [CI/CD Pipelines](#)

Verification

1. Verification SHALL confirm that [Crucible](#) executes a Machine Image build
2. Verification SHALL confirm that the build produces a [Machine Image](#)

Verification may include:

- Machine Image build testing
- Build-output inspection
- Machine Image artifact inspection
- Build-log inspection
- Automated [CI/CD Pipeline](#) testing

The verification record SHALL identify:

1. The tested Machine Image build
2. The resulting Machine Image
3. The build result
4. The observed output
5. The generated [Evidence](#)

Outgoing Traceability

This requirement realizes:

- [MO-001](#)
- [MO-005](#)
- [MO-006](#)

This requirement relates to:

- [FR-IMG-003 — Immutable Infrastructure Workflows](#)
- [FR-IMG-004 — Image Signing](#)
- [FR-IMG-005 — Image Verification](#)
- [FR-IMG-006 — Image Promotion Workflows](#)
- [FR-DEP-002 — Deploy Virtual Machines](#)
- [6. Machine Images and Image Layers](#)
- [10. Reproducibility, Provenance, and Traceability](#)

Referenced By

The wiki Backlinks function provides the current list of pages that reference FR-IMG-001.

Incoming [Traceability](#) should be derived dynamically from backlinks rather than maintained as a duplicate manual list.

Backlinks identify incoming references but do not define the semantics of each relationship. Referencing pages should identify whether the relationship represents realization, refinement,

verification, dependency, or another defined traceability relationship.

ConOps Relationship

The Crucible Concept of Operations describes a Phase 1 workflow in which a [CI/CD Pipeline](#) invokes [Crucible](#) to compose selected inputs and build a hardened [Machine Image](#).

FR-IMG-001 establishes the required Machine Image build behavior within that workflow.

Requirements governing image composition, hardening, signing, verification, promotion, compliance, and deployment define separate behavior associated with the resulting Machine Image.

Delivery Phase

Phase 1

Implementation Status

Not Assessed

Implementation status requires verification that [Crucible](#) builds a [Machine Image](#).

Requirement Status

Draft

The source System Requirements Specification identifies Version 1.1 as a draft.

Notes for Editors

This requirement page should retain the stable requirement identifier FR-IMG-001.

Changes to the Statement SHALL preserve the approved intent of the source requirement.

The Source Statement should preserve the original wording from the controlling System Requirements Specification.

The Statement should remain limited to building a Machine Image.

Requirements for image composition, hardening, signing, verification, promotion, compliance assessment, distribution, and deployment should remain in their applicable requirement pages.

Verification criteria should test only the behavior stated in the normalized Statement and should not introduce additional normative obligations.

Incoming Traceability should use the wiki Backlinks function rather than a manually maintained list.

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```
{{section>dido:02-crusible:99-annexes:annex-c-requirements:03-functional-requirements:03-02-image-management:fr-img-001#Statement&noheader&nofooter&noeditbtn}}
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