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WiMAX Forum[®] Release Structure and Process

WMF-A11-002-v02
WMF Approved
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1. WiMAX Forum® (WMF) Industry Releases and Certification Releases

1.1. Definition of WiMAX Forum Industry Release

A WiMAX Forum® Industry Release is a set of WiMAX Forum approved Stage 1 to 5 specifications (Please refer to Section 4) and relevant external referenced specifications, consistent with each other, presented to the industry as a single package of a significant added value compared to previous release, either in the air interface or network or both. Some technical specifications may remain unchanged and repeated to serve more than one Release. The release tracks may reflect partitioning of WiMAX ecosystem into technology domains (as for example 16e vs. 16m) or business domains (as for example mobile cellular broadband service vs. vertical applications).

The decision on initiating a new Industry Release rests with TSC with input from MWG and authoring WGs. The WiMAX Forum approved specifications which comprise a WiMAX Forum Industry Release are detailed in a “Release Manifest” document which is maintained by the TSC. Specifically:

- A working group may update its specifications within an Industry Release through the WiMAX Forum CR process. If those updates are restricted to “bug fixes”, the new version of the specification will automatically supersede the previous version upon publication of the new version. The responsible WG will notify TSC including update to the “Release Manifest” document accordingly, for TSC approval.
- If in exceptional circumstances when specification revision includes new features or capabilities, then the TSC shall decide whether or not to apply the revision to an existing or new Industry Release.
- Specifications from one Industry Release will normally be incorporated into the subsequent Industry Release unless the authoring WG takes one of the following actions:
 - Publish a new revision of the specification
 - Deprecate the specification

The “Release Manifest” provides the complete list of all specifications that make up that Release. The decision on the interval between Industry Releases also rests with TSC with input from MWG and authoring WGs. This interval will typically be between 18 and 24 months.

1.2. Definition of WiMAX Forum Certification Release

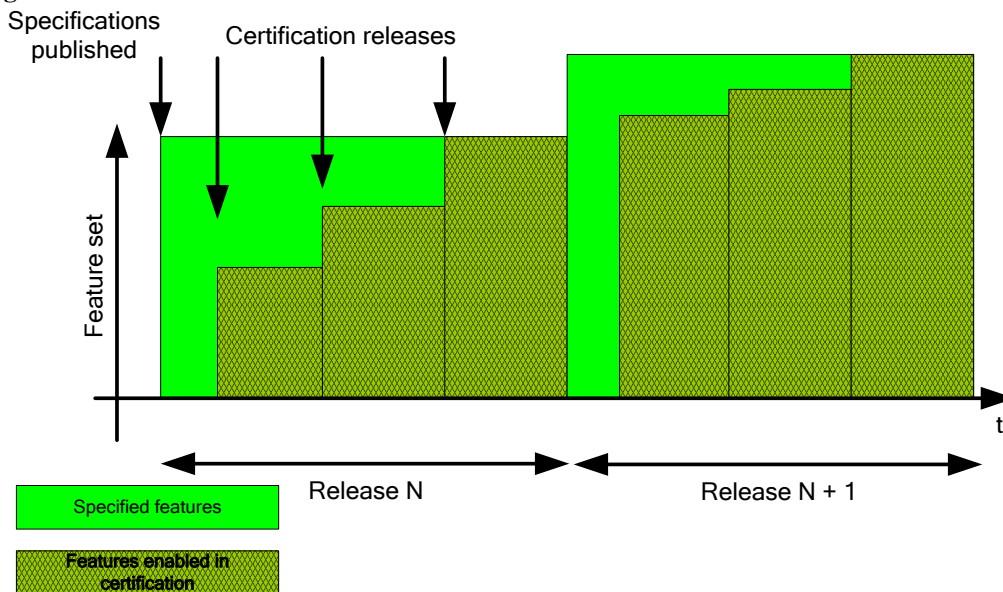
For a WiMAX Forum Industry Release under development, WiMAX Forum Certification Releases are used for the gradual enablement of feature packages in certification testing to fulfill the Industry Release (see Figure 1).

- The WMF Certification Release is defined as a subset of certifiable feature packages drawn from the full set of feature packages constituting the WMF Industry Release.
- CWG implementation of test cases for a feature package depends on TEV and MS and BS equipment vendors’ implementation of said feature.

- The CWG will conduct regular surveys with the TEV and equipment vendors to determine the certifiable subset of feature packages corresponding to a given Certification Release. This subset is reviewed and updated during the implementation and validation process. The CWG will report the results of these surveys to the corresponding WG(s) and a call for support on short fall in any feature package(s) in the WMF Specification Release will be made and the relevant WG(s) will be notified.
- CWG will implement certification on a feature package in the Certification Release when either of the following conditions is noted:
 - All required test cases for a feature package are available.
 - The subset of test cases which are available for a feature package have been officially confirmed by the responsible WG (e.g., TWG or NWG) as being sufficient to verify compliance for that feature package.

Initial introduction for certification of any feature package as well as updates in the test cases (e.g., upgrades and downgrades that affect a feature package) are managed via the CRSL and may be introduced in subsequent major certification releases. Feature packages will be retained in the certification testing only if the testing is sufficient to verify compliance of that package.

Figure 1. WMF releases and certification releases



Most of the activity of an Industry Release is focused on the development of new specifications or the update of existing specifications. Since the specifications are developed in different WMF Working Groups, a large degree of coordination needs to take place to ensure functional alignment and schedule alignment so that a coherent set of specifications are developed on time.

Once the Specifications are developed by the WMF, vendor companies implement products conforming to those specifications. The WMF Certification Release then verifies the conformance of those products to the specifications.

The WMF Industry Release is fulfilled once the WMF Certification Release has verified conformance of all features in the Industry Release for which certification testing is required.

CWG will provide regular reports to TSC regarding the status of the Certification Release including the list of feature packages which are intended to be certified and have not yet been incorporated into the

1 Certification Release. Based on these status reports, TSC will have the following options in deciding
2 when a WMF Industry Release can be announced:

- 3 • If the TSC determines, with explicit input from MWG, that one or more of the features packages
4 intended for certification but not yet included in the Certification Release are critical to the
5 Industry Release, the TSC can decide to defer the Industry Release announcement until such
6 time as all critical features packages are included in the Certification Release.
- 7 • If the TSC determines, with explicit input from MWG, that none of the features packages
8 intended for certification but not yet included in the Certification Release are critical to the
9 Industry Release, the TSC can decide to defer those features to the next Industry Release and
10 announce the current Industry Release with those feature packages deleted from the Release
11 Manifest.
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14 **1.3. Technology Tracks and Certification Tracks**

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17 The Technology Tracks and Certification Tracks reflect partitioning of WiMAX ecosystem into
18 technology domains (as for example 16e vs. 16m) or business domains (as for example mobile cellular
19 broadband service vs. vertical applications). A certification track may evolve through one or several
20 Certification releases.
21

22 Classification of certification tracks is based primarily on Air Interface Technology
23 and further on the following

- 24 • Retail vs. Non-Retail applications such as AeroMACS or M2M
- 25 • Radio Band class
- 26 • Device Category (new for 16m MS devices)

27 Every certification track is realized through one or more Certification Releases. Certification releases for
28 non-Retail applications should be aligned with corresponding certification releases of Retail. For
29 example, the AeroMACS certification can be conducted based on certification release 1a with possible
30 minor exceptions based on specific AeroMACS requirements.
31
32

Industry releases	WiMAX (16e) Technology Track		WiMAX-Advanced (16m) Technology Track
	Open Retail Certification Track (The baseline track)	AeroMACS Certification Track	WiMAX-Advanced baseline certification Track
Industry Release A	The OR1a (Release A) Manifest	The OR1a AeroMACS Manifest	N/A
Industry Release B	The OR1b (Release B) Manifest	TBD	WiMAX-Advanced Manifest
Industry Release C	The OR1c Manifest [to be created]	TBD	

2. Six Stages of a Release

WMF Releases encompass six specification stages:

- A Stage 1 specification specifies requirements rather than “how” they should be realized. Stage 1 specifications are usually developed by SPWG.
- A Stage 2 specification specifies architecture, based on the Stage 1 requirements specifications. This specifies “how” the requirements are implemented at the architecture level.
- A Stage 3 specification specifies protocol-level details, based on the Stage 2 specifications. This specifies “how” the architecture-level specifications are implemented at the detailed protocol level. In some cases, the specification may include significant normative references to standards or other specifications developed outside the WiMAX Forum®.
- A Stage 4 specification is an implementation conformance statement, pro forma. This is a template to be completed to specify that a specific piece of equipment is conformant to a list of functional elements in the Stage 3 specification.
- A Stage 5 specification defines the detailed test purposes and test procedures of a conformance plan.
- A Stage 6 specification defines the detailed certification process and conformance testing instructions.

Alignment of these six stages of specifications is essential. Stage *I+1* specifications must be developed to meet all Stage *I* specifications. If, in an exceptional case, a Stage *I* element cannot be met in Stage *I+1*, the Stage *I* specification must be aligned. Conversely, there should be no Stage *I+1* specification elements without a basis in a corresponding Stage *I* specification. It is important that each Stage *I+1* specification include documentation relating each element to corresponding elements of the Stage *I* specification.

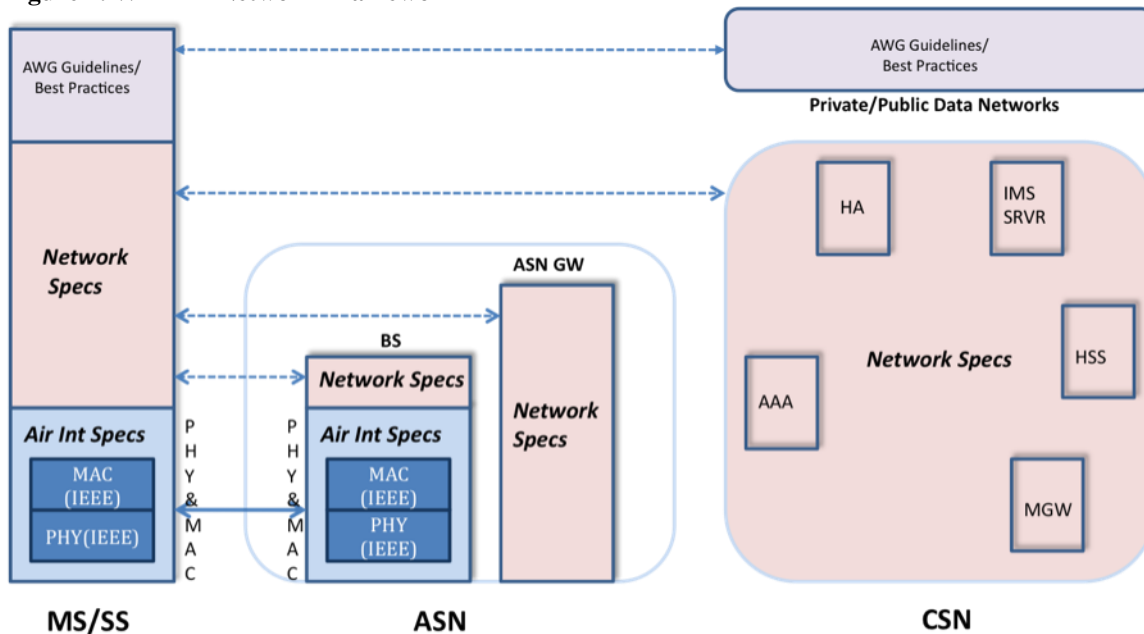
3. WiMAX® System Functional Areas

The objective of this section is mostly to identify the different functional areas of the WiMAX® System developed by (a) Air Interface specifications, (b) Network specifications and (c) Roaming specifications.

3.1. WiMAX® Network Framework

A WiMAX Forum® Release includes Air Interface and Network specifications addressing the functional areas identified in Figure 2. The scale of the elements is not intended to represent the amount of work expended in a given functional area.

1 **Figure 2. WiMAX Network Framework**



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Physical layer (PHY) and Medium Access Control (MAC) layer specifications typically make use of normative references to IEEE Std 802.16.

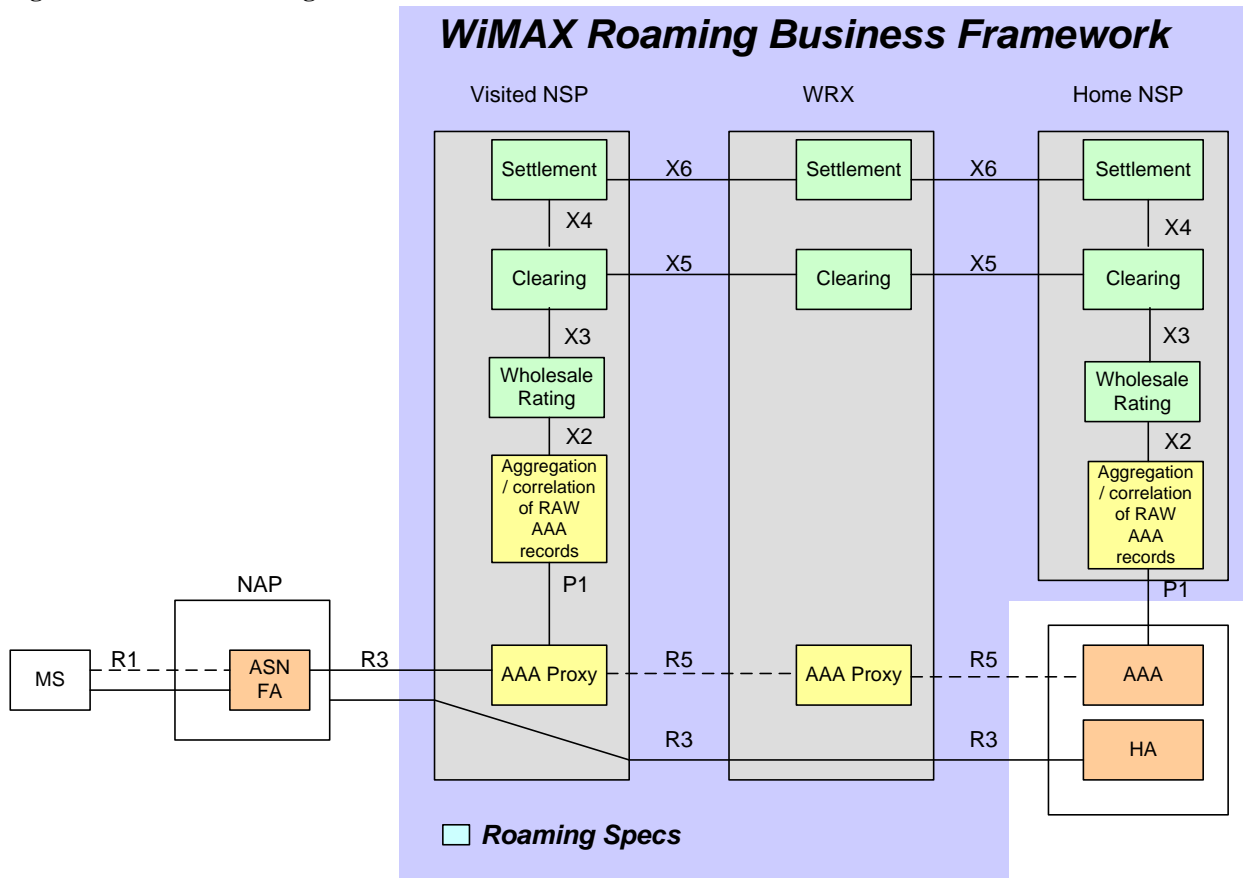
Guidelines and best practices are developed by AWG in areas such as applications and are usually not part of a Release.

13 **3.2. WiMAX Roaming Business Framework**

14 Besides the network shown in Figure 2, GRWG develops specifications for the WiMAX® Roaming
15 Business Framework. This network deals with functions such as wholesale rating, clearing, and
16 settlement between operators when subscribers roam among their networks.

17

1 **Figure 3. WiMAX Roaming Business Framework**

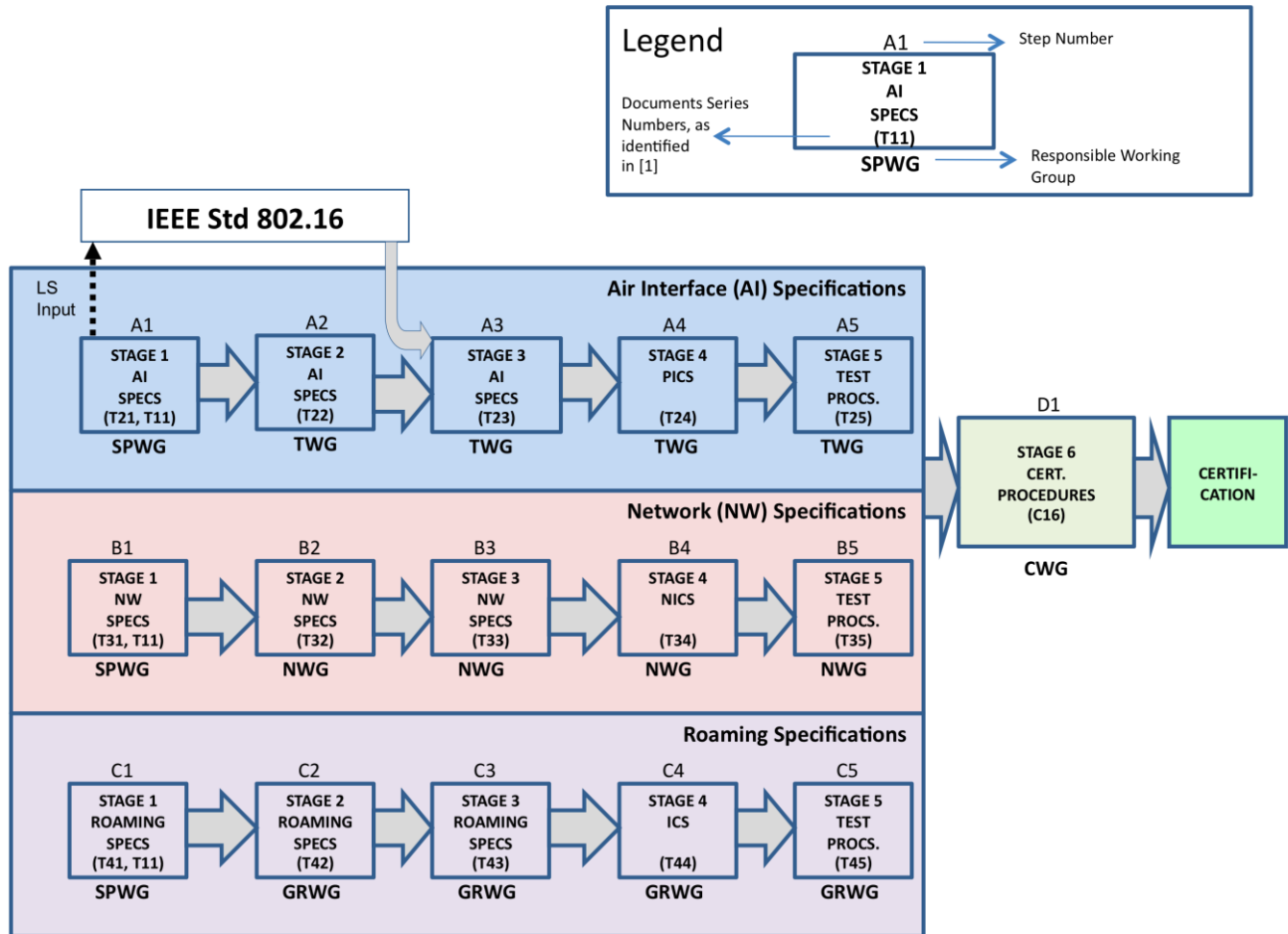


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WiMAX Release Development Process

Figure 4 shows the development steps involved in creating a WiMAX Forum® release. The final step shown is certification, which is addressed not here but in the documentation of the Certification Working Group.

Figure 4. Release Development Steps



The figure generally illustrates the order of specification development. However, this is not a strictly serial process. Some overlap between steps may be appropriate. For example, development of a Stage 3 specification may begin before the corresponding Stage 2 specification is complete. However, a Stage *I*+1 specification shall not be approved until the corresponding Stage *I* specification has been approved.

Management details of specification documents, including their naming and identification, are specified in [1].

The procedure for the development of a specification is specified in [2].

RWG may provide regulatory input regarding Step A3.

4. Release Project Management and Roadmap

As it is evident from the WiMAX® Release development process, the various specifications comprising a WiMAX Release originate in different working groups. These specifications have mutual dependencies as well as external dependencies via normative references to external specifications. It is important that specifications are substantive, consistent, and accurate, and are completed on time so that the entire Release remains on schedule. Delay in completion of a Release can have dire consequences on the vendors, operators, the WiMAX ecosystem, and the market. As a result, Release Project Management is a very important element of a WiMAX Release. The Chair of the Technical Steering Committee (TSC) has overall responsibility for Release Project Management.

The detailed schedule for a Release is established upfront by the TSC. The schedule should be detailed enough to show the expected completion of activities by the various WGs and take account of the interdependencies. Once the Release plan is approved by the TSC, the WGs are responsible to progress their respective activities in accordance with the planned schedule.

The TSC Chair will ask the WG Chairs to provide their status and progress reports during the Technical Plenary meetings, and between such meetings as necessary, in order for the TSC to ensure that the WG progress tracks the Release plan. Any risk in the potential completion of a task should be identified by the WG as early as possible. The TSC may provide guidance to the WGs to mitigate the risk so that the WG can complete the task on schedule.

The TSC Chair will maintain the Release plan and update it periodically to reflect the latest status of all tasks. The TSC Chair will keep the TSC members updated on the latest Release plan.

5. Pipelining of Releases

The WiMAX Forum® typically performs development activities on multiple Releases simultaneously. While certification addresses Release $N-1$, Release N may be in the Development Step and requirements may have already been defined for Release $N+1$. For example, while Release $N-1$ activity may focus on Stage 6, Release N work may primarily be at Stage 3 and Release $N+1$ may be exclusively at Stage 1.

5.1. Release transition of WiMAX Forum specifications

WiMAX Forum specifications in a particular release may become part of another release, either in original state or updated or corrected by an amendment. If a document is reused by a later Release in its original state, the document is listed by its original document identifier indicating the original Release and version in the manifest of the later Release.

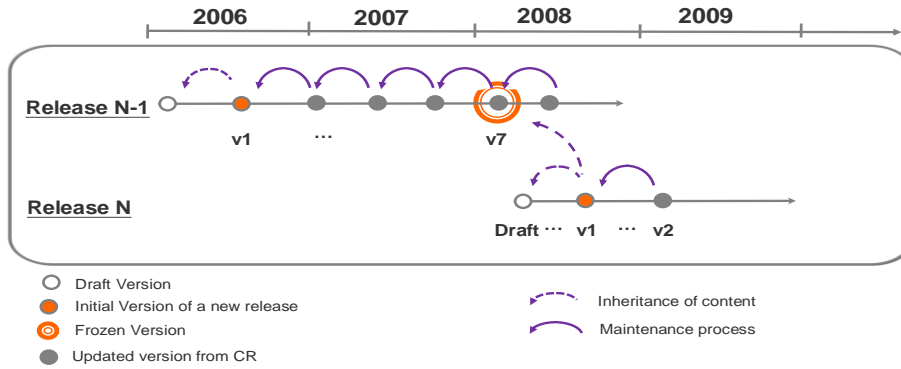
WiMAX Forum specifications that are based on an amendment on a previous Release specification indicate in their document identifier the new Release, and the version is reset to 1.

5.2. Maintenance of WiMAX Forum Specifications

The approved specifications in a Release may contain deficiencies, ambiguities, and errors. These issues are addressed and eliminated by a document maintenance process leading to controlled modifications and updates of the documents based on change requests. When a new version of a WiMAX Forum specification is drafted for approval by implementing a set of approved change requests, the version number of the document is incremented to distinguish it from its previous edition. For further details on processing change requests, see [2].

1
2 If a WiMAX specification is part of multiple releases, a maintenance update will affect all Releases. If the
3 maintenance update is to affect only some Releases, then a new specification must be created for those
4 Releases, each reflecting the number of the earliest Release to which it belongs. If the specification is
5 customized for a later release, the version field is reset to 1, as illustrated in Figure 5.
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Figure 5. Document maintenance



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11 The Release Manifest for each Release shall be updated to reflect any changes to the content of the
12 Release, including changes in version number.
13

6. WiMAX Forum Release Names

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16 The WiMAX Forum® Industry Release numbering scheme is the following; Release A, Release B,
17 Release C etc. Every of Industry Releases may incorporate one or more technologies:

- 18 • WiMAX (802.16e-2005)
- 19 • WiMAX Advanced (802.16m-2011)

7. References

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24 [1] WMF-A11-001 (*WiMAX Forum Documentation Structure and Identification*)
25
26 [2] WMF-A11-003 (*WiMAX Forum Technical Activity Procedures*)