

# PCI-SIG Specification Development Procedures

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## 1) Scope of Authorization

The BoD must authorize all specification development projects prior to any specification work beginning in any work group.

A Scope of Authorization is required prior to the development of all new and revised specifications. Depending upon the scope and potential impact of new or revised ECN may have on PCI-SIG technologies or technologies related to PCI-SIG technologies, the BoD may require a Scope of Authorization prior to the development of such ECN.

The scope of the project must be clearly defined in the authorization motion. The BoD must approve subsequent changes to the Scope of Authorization. Specifications or ECN that are either deficient in meeting the requirements set out in the Scope of Authorization, or expand beyond it are subject to rejection by the BoD – The deviation or addition must be approved prior to BoD consideration of the specification or ECN. At any time in the development process, the WG Chair can petition the board for a change of charter. Likewise at any time, any member company can petition the BoD if they feel a WG is exceeding its charter.

Work necessary to develop the SoA can take place in any of three forums:

- i) An existing technical work group
- ii) An ad-hoc committee established by the BoD
- iii) One or more member companies working privately

Research of market requirements as a predicate to developing the SoA can be facilitated through the various Technical Communication or Technical Work Groups.

A detailed requirements document shall be included with a Scope of Authorization submission to the BoD. This document, at a minimum, shall include the following information:

- o Detailed explanation of targeted usage models and associated problem statements
- o Detailed description of the requirements derived from the usage models and problem statements
- o Objective, quantifiable data to validate that the requirements are sound and will provide meaningful value and benefit to the PCI-SIG members and industry. Data may be presented in multiple forms: functional analysis, performance analysis, modeling or simulation to illustrate projected benefits, implementability analysis (per section 9 of this document), and commercial viability analysis to validate the requirements are applicable beyond a niche (per section 10 of this document), etc.

The SoA must include a Compliance and Interoperability section (C&I SoA) that describes the need or not for a C&I Test Suite, and if necessary, its scope and requirements. Not all Specifications or ECNs must have a C&I Test Suite, but if one is determined necessary, then the additional procedures described in the Appendix for C&I Test Suite development procedures must be followed. When the C&I scope and requirements cannot be stated at the time the SoA is approved, completion of the C&I SoA may be delayed up to the time the 0.5 Draft (for Specifications) or the 0.9 Draft (for ECNs) is approved.

Note for ECNs that do not have an associated SoA, no C&I SoA is needed either, but the C&I dependencies must still be addressed in the “Analysis of C&I Test Implications” section in the ECN (see ECR/ECN template document).

## 2) Compliance to PCI-SIG Committee Procedures

All specifications and ECN shall be developed within an officially sanctioned work group in accordance with the PCI-SIG Committee Procedures document.

### 3) Importation of Completed or Partially Completed Work

If and when the PCI-SIG elects to adopt a completed or partially completed specification or ECN from outside of the PCI-SIG, BoD approval is required. An SoA will be created defining any remaining work to be completed, and the project will be assigned to either an existing or a new work group. The BoD will determine the appropriate revision level at which to commence specification or ECN development.

### 4) Specification and ECN Numbering

Documents shall conform to the following numbering guidelines unless the BoD authorizes deviation.

#### Numbering of Released Specifications

Released specifications are numbered X.Y, where “X” is an integer identifying major releases and Y is an integer representing minor releases. Revisions start numbering from 1, thus revision 1.0 is the first public release of a new specification.

A lower-case alpha character may be appended (X.Ya) to denote editorial revisions, additions of explanatory text, clarification of vague, incomplete, or ambiguous requirements, resolution of conflicting requirements, etc. In no case can functional changes or new features be included in an “alpha” rev, even if such changes have been approved through the ECN process. Example: Revision 1.2 indicates the second minor revision of the first major release. 1.2.a represents a clarifying enhancement to the 1.2 specification.

For specifications that are updates to an earlier version or generation (e.g. a 2.0 update to an earlier 1.0 generation), the new or updated material should be included (and highlighted) in the appropriate sections or paragraphs in the earlier document to clearly show the context and relationship of the new material to the earlier specification.

#### Numbering of Specification and ECN Drafts - prerelease

Drafts are numbered as X.Y.a draft Z where Z is defined below. For example, the X.3 draft of the 2.3 spec = 2.3 draft.3. All drafts are to be dated.draft.0x = Initial text prior to being assembled into a cohesive document. Such documents are viewed as speculative work product unsuitable for review outside of the WG. Further, such documents are not to be viewed as representing a consensus of the WG. (x = any integer)

Even numbered drafts (e.g. 0.2, 0.4, etc.) may be used internally by the WGs for intermediate versions prior to the next odd numbered draft, but are not normally expected to be distributed to other WGs or the general membership.

Draft 0.3 = First review draft (specifications and ECNs [ECNs only if BoD requires])

#### Mandatory

- Clean problem definition
- Complete set of proposed architectural requirements
- Compliance with SoA
- Workgroup approval
- Cross workgroup and Board review
- Membership review

#### Optional

- Background information and proposed methods to execute the requirements
- Some sections of the document may be missing or incomplete
- Tech writer generated draft

#### Member feedback

- Suggestions and/or validation of requirements for the new specification
- Initial IP assessment
- Company WG participation assessment

## PCI-SIG Specification Development Procedures

Draft 0.5 = First comprehensive draft (specifications only)

### Mandatory

- Final problem definition
- Final complete set of architectural requirements
- Compliance with SoA
- C&I SoA must be complete
- C&I Test suite decision – if required, C&I test spec development must start
- Workgroup approval
- Cross workgroup and Board review

### Optional

- Background information and proposed methods to execute the requirements
- Tech writer generated draft

### Member feedback

- Inform the members of the final requirements
- Final feedback and suggestions for the new specification

Draft 0.7 = Second comprehensive draft (specifications only)

### Mandatory

- Final complete set of architectural requirements
- Complete set of methods to execute requirements, minimal and minor TBD
- Compliance with SoA
- If C&I Test suite required, C&I test spec rev 0.3 must be complete
- Tech writer generated draft
- Workgroup approval
- Cross workgroup and Board review

### Optional

- Nothing optional

### Member feedback

- Validation of fine detail of architecture
- Validation of methods and that they meet requirements

Draft 0.9 = Final membership review draft/Release Candidate (specifications and ECNs)

### Mandatory

- Final complete set of architectural requirements
- Final and complete set of methods to execute requirements - no TBD
- Compliance with SoA
- For specifications if C&I Test suite required, C&I test spec rev 0.5 must be complete
- For ECNs that have an SoA, the C&I SoA must be complete
- Tech writer generated draft
- Workgroup approval
- Cross workgroup and Board review

### Optional

- Nothing optional

### Member feedback -

- Validation of methods and that they meet requirements
- Conduct 60 day IP review

### Notes -

- Only editorial changes are allowed to 0.9 draft
- Any functional change requires return to a 0.7 draft
- Relaxations do not constitute functional change

1.0 = Final release (Specifications and ECNs)

### Mandatory

## PCI-SIG Specification Development Procedures

- Tech writer generated document
- Final and complete specification / ECN to execute requirements
- If C&I Test suite required, C&I test spec rev 0.7 must be complete
- Workgroup approval
- Cross workgroup and Board review

### **5) All Work Group Review**

Drafts of all specifications, errata, ECN, etc. must be submitted to all other workgroups for review prior to submission to the BoD for member distribution.

The review period is 30 days excepting errata, for which the review period is 14 days. The chair of the work group developing the document can request of the BoD that the review period be shortened to 14 days.

### **6) Board of Directors Reviews**

Drafts of the specifications, errata, ECN, etc. must be submitted to the BoD for review prior to member distribution. The BoD review is in serial with the work group review process. The intent of BoD review is compliance with the Scope of Authorization, completeness, and professionalism. All technical comments by BoD members should be submitted during the work group specification development/review process prior to the specification being submitted to the BoD for approval. No technical content changes shall be made during the BoD review.

The BoD has no less than 14 days to act on the motion to release. The BoD can at its discretion vote to shorten this review period. BoD action is required no later than 30 days after the motion to release is proffered.

All material submitted for BoD review must be complete and in the form intended for release (i.e., the BoD is reviewing the exact document to be released). Any changes made to an already submitted document will lengthen the review period by 7 days.

### **7) Membership Reviews**

Draft versions shall be posted as releases on the Member web site and announced by email at the 0.3, 0.5, 0.7, 0.9, and 1.0 revision levels for specifications and 0.3 (if required by the BoD), 0.9, and 1.0 for ECNs. A minimum of 2 months must separate posted specification releases and a minimum of 1 month must separate posted ECN releases unless the BoD explicitly approves a shorter period. Steps may not be skipped without BoD authorization. Relaxation of these provisions is only intended to facilitate revisions that are relatively minor in nature.

Member feedback must be posted on a members-only website in a timely fashion. The WG must send a formal response to the originator of each feedback item (email is sufficient). Both feedback and responses must be permanently retained as part of the Work Product Archive (defined below).

Any notification of potential IP infringement by a member Company must be documented in the Work Product Archive and reported to the BoD. Note that members are under no obligation to notify the PCI-SIG of believed IP infractions prior to the formal 60-day IP review period.

### **8) Text Development**

With the exception of the directives below, the procedures for developing specification text (text here means words, figures, tables, and other meaningful markings) are up to the WG chartered with creating the specification.

All specifications from the X.03 level of development shall comply with PCI-SIG style requirements.

## PCI-SIG Specification Development Procedures

In general, informative text that explains or illustrates normative text is strongly encouraged.

Marketing and market positioning text is not appropriate in PCI-SIG specifications or ECN.

- a. **Mandatory Sections** – All specifications shall include the following mandatory sections (ECN shall follow the ECN template which is provided in a separate document from these procedures). Additional sections may be included at the discretion of the WG.
  - i. Cover page
  - ii. Revision history
  - iii. Disclaimers and Warrantees
  - iv. Acknowledgment of contributors
  - v. Contents
  - vi. List of figures
  - vii. List of tables
  - viii. Document conventions
  - ix. Terms and abbreviations
  - x. Reference documents
  - xi. Introduction defining the technology and its system context
- b. **Formal Contributions** – Not all input to a WG need be in the form of formal contributions. In the event that a company participating in the WG submits a significant piece of work – text, test results, etc. – to the WG, a formal procedure is required to document and record the contribution. At a minimum, the WG will maintain an archive that includes the contribution, date received, name of the contributor, and name of the contributing company. A simple archiving of a transmitting email is sufficient to satisfy this requirement. This archive will be included in the Work Product Archive (defined below).
- c. **Issues Tracking/ Resolution/ Documentation** – While encouraged as good practice, there is no formal requirement that WG's maintain an open/closed issues list. If such a list is maintained, it is to be included in the Work Product Archive (defined below).
- d. **Minority Reports** – If, at any time, the position of a participant company on some issue is rejected – either voted down, or simply ignored – it is the right of that company to submit a minority report outlining the company's position in writing. This report must be included in the Work Product Archive (defined below).

While such action will have no bearing upon the outcome of votes or the WG's actions, it does place the participant company's argument in the official record and informs the Board of Directors of issues that it may consider if and when the Board of Directors is required to take action on the work product of the WG.
- e. **Professional Quality of Specification and ECN Text** – The writing, tables, and graphics must be of professional quality. Failure to maintain professional workmanship is grounds for rejection by the BoD. Note that the quality level during early stages of specification development is not expected to match that of the final product, but still must be sufficiently clear as to enable review and understanding by the PCI-SIG Member Companies.

### 9) Implementability

All specifications and ECN must be implementable in commercially available manufacturing technologies and at commercially reasonable costs.

## 10) Commercial Viability

While the market success of any product or technology cannot be guaranteed, care must be taken to generate commercially viable specifications and ECN. It is the participant companies' responsibility to steer the specification and ECN appropriately such that it satisfies market needs.

## 11) Verification

It is the WG's responsibility to verify the correctness of all protocols, state machines, and electrical parameters prior to the final release of the specification and ECN.

## 12) Intellectual Property

Intellectual Property rules are defined in the PCI-SIG Bylaws and the PCI-SIG Membership Agreement. That said, member companies are encouraged to raise any IP issues at the earliest possible point in the specification development process in order to avoid complications and wasted effort.

The WG must report any IP issues to the BoD, and record them in the Work Product Archive (defined below).

## 13) Liaison Responsibilities

It is the WG chair's responsibility to establish liaison relationships with all PCI-SIG WGs with technologies that must inter-work. WGs are highly encouraged to establish liaison relationships with any non-PCI-SIG organizations where interoperability is anticipated.

## 14) Errata Procedure

After a specification or ECN is released, issues may arise concerning inaccuracies, confusing text, omitted text, etc. As such issues arise, they must be documented, tracked, and their resolutions made available on the members web site in a timely manner. The issue status-tracking list becomes part of the Work Product Archive (defined below).

Errata include corrections for the following:

- Typographical and other errors that do not materially effect requirements
- Unclear or ambiguous requirements
- Incomplete or inadequate treatment of corner cases
- Conflicting requirements
- Errors that make the specification contradict the intent of the WG as documented in the Work Product Archives (e.g., an error introduced in the late draft of the spec but overlooked until after final release)
- Errors that prevent the development of interoperable devices (e.g., a parameter value that is discovered to have too wide a range to guarantee robust interoperability).

After approval by the WG, errata are to be posted on the member's web site when there is a sufficient Body of information to potentially affect SIG members in a significant way. Significance is judged both on the volume of errata and on the significance of each individual erratum. In all cases, errata must be posted no later than 6 months after their approval by the WG.

No features may be added or deleted from a specification or ECN via this process.

### **15) Work Product Archive**

Each WG is required to maintain an archive including, as a minimum, the following:

- a. All released specification and ECN revisions
- b. All unreleased specification and ECN snapshots (i.e., any internal draft sent to the work group for review)
- c. All meeting minutes
- d. All formal contributions
- e. Any Issues List(s) maintained by the WG
- f. Errata
- g. Specification and ECN feedback
- h. All test results

### **16) Meeting Records and Status Reporting**

All Work Groups engaged in specification and ECN development must comply with the reporting procedures defined in the PCI-SIG Committee Procedures as amended by the BoD.

### **17) Adding/Changing Functionality of Released Specification**

After a specification or an ECN has been released, the need may arise to change or add functions.

Rule #1: Adding any new feature requires bumping the revision number of the specification or ECN. It must be assumed that member companies have designs that are either completed or in progress. These designs cannot become non-compliant by any specification change.

Rule #2: Each revision of the specification or ECN must maintain backward compatibility, unless it is determined that there is significant value to the SIG membership to give up such compatibility. Any dropping of backwards compatibility must be approved by the BoD as part of the Scope of Authorization process – either in the original motion sanctioning the specification development or in a subsequent amendment.

PCI-SIG Specification Development Procedures

18) Spec Dev Revision Matrix

	Group	SoA*2	0.3 *2	0.5	0.7	0.9	1.0	C&I 6mo FYI	C&I Live
<b>Specs</b>	<b>Developing WG</b>	Approve	Approve	Approve	Approve	Approve	Approve		
	<b>C&amp;I WG (*1 If C&amp;I test spec required)</b>			C&I SoA Approve	0.3 Test Spec approve	0.5 Test Spec approve	0.7 Test Spec approve	0.9 Test Spec approve	1.0 Test Spec approve
	<b>BoD</b>	Approve	Approve	Approve	Approve	Approve	Approve	Approve	Approve
	<b>All WGs</b>		Review	Review	Review	Review	Review		
	<b>PCI-SIG Membership</b>	SoA posted to website	0.3 rev 30 day review	0.5 rev 30 day review	0.7 rev 30 day Review 0.3 Test Spec 30 day review	0.9 rev 60 day + IP Review 0.5 Test Spec 30 day review	1.0 Spec Posted to website 0.7 Test Spec 30 day review	0.9 Test Spec & βTest Tools posted – FYI testing	1.0 Test Spec & Test Tools posted – Integrators List
<b>ECNs</b>	<b>Developing WG</b>	Approve (if BoD req.)	Approve (if BoD req.)			Approve	Approve		
	<b>C&amp;I WG (*1 If C&amp;I test spec required)</b>					C&I SoA Approve		0.9 Test Spec	1.0 Test Spec
	<b>BoD</b>	Approve (if BoD req.)	Approve (if BoD req.)			Approve	Approve	Approve	Approve
	<b>All WGs</b>					Review	Review		
	<b>PCI-SIG Membership</b>	SoA Posted to website (if BoD req.)	0.3 rev 30 day review (if BoD req.)			0.9 rev 30 day + IP Review	1.0 ECN Posted to website	0.9 Test Spec & βTest Tools posted – FYI testing	1.0 Test Spec & Test Tools posted – Integrators List

Notes:

1. The C&I SoA must be finalized by the 0.5 rev of the target specification (0.9 for ECNs) and if the C&I SoA requires a Test Suite to be developed, then the C&I milestones highlighted in blue text must be followed.
2. The Board of Directors may decide that an ECN requires a SoA and/or that it requires a 0.3 revision be posted to the membership for review, and if so, the ECN must also follow the respective columns that are highlighted in green text.