SPECTRUM SHARING COMMITTEE RELEASE PLAN

Approved by the Spectrum Sharing Committee Steering Group

25 March 2020
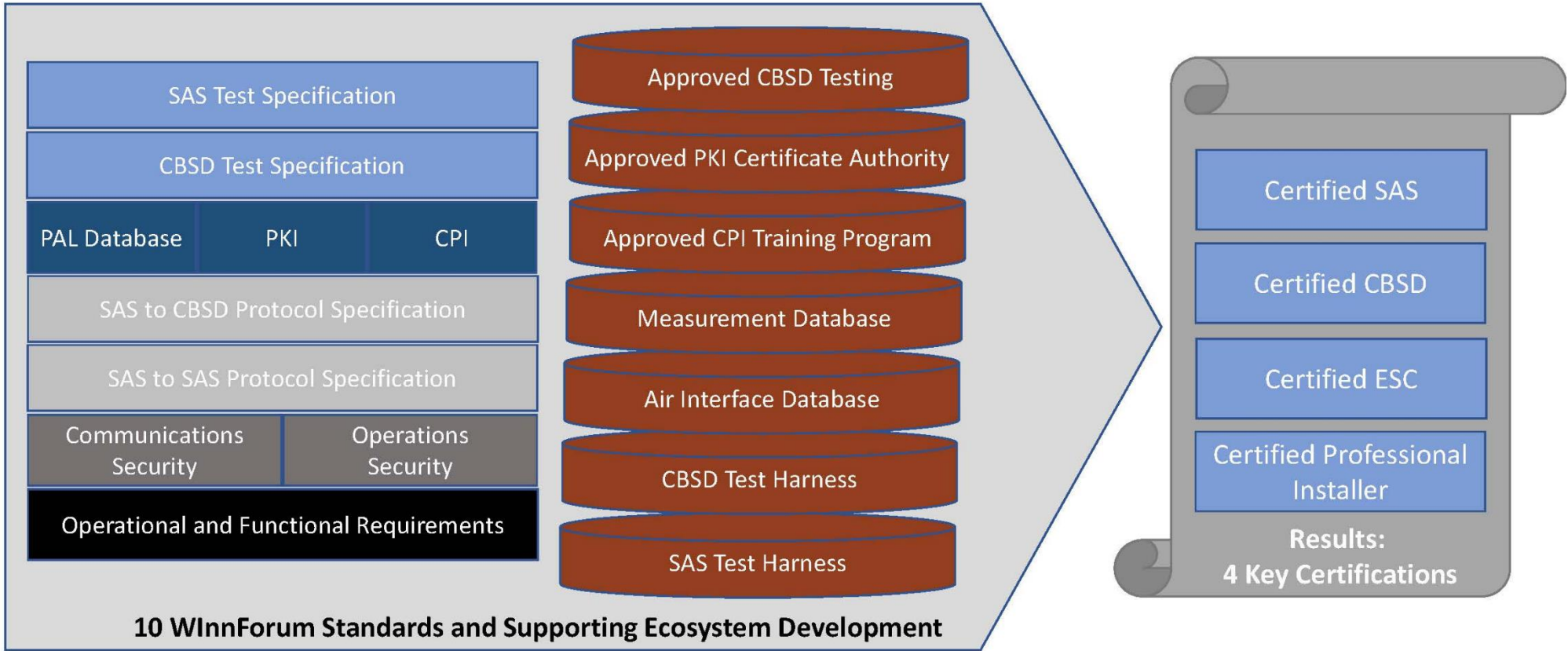
Release 1

Commercializing CBRS: Standards and Ecosystem Support

| SAS Test Specification |
| CBSD Test Specification |

| PAL Database | PKI | CPI |

| SAS to CBSD Protocol Specification |
| SAS to SAS Protocol Specification |

| Communications Security | Operations Security |

| Operational and Functional Requirements |

- Approved CBSD Testing
- Approved PKI Certificate Authority
- Approved CPI Training Program
- Measurement Database
- Air Interface Database
- CBSD Test Harness
- SAS Test Harness

10 WInnForum Standards and Supporting Ecosystem Development

- Certified SAS
- Certified CBSD
- Certified ESC
- Certified Professional Installer

Results: 4 Key Certifications

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CBRS WInnForum Standards®

WIRELESS INNOVATION FORUM®

Standards That Comprise Release 1

WINNF-TS-0112 Operational and Functional Requirements

WINNF-TS-0065 CBRS Communications Security Technical Specification

WINNF-TS-0071 CBRS Operational Security Technical Specification

WINNF-TS-0016 SAS to CBSD Protocol Specification

WINNF-TS-0096 SAS to SAS Protocol Specification

WINNF-TS-0061 SAS Test and Certification Specification

WINNF-TS-0122 CBSD Test and Certification Specification

WINNF-TS-0245 PAL Database Specification

WINNF-TS-0022 CBRS PKI Certificate Policy

WINNF-TS-0247 CPI Training Program Accreditation Standard

Release 1 Policy Documents

WINNF-SSC-0001 Air Interface and Measurement Policy

WINNF-SSC-0002 Registered Air Interfaces and Measurements

WINNF-SSC-0003 Traceability Matrix

WINNF-SSC-0004 Release Plan (this document)

WINNF-SSC-0005 <withdrawn>

WINNF-SSC-0006 <withdrawn>

WINNF-SSC-0007 Margin Policy

WINNF-SSC-0008 Coordinated Periodic Activities Policy (CPAS)

Standards Milestones

CA Accredited: Q4 2017

Baseline Standards Announced: Q1 2018

CBSD Test Code Released: Q2 2018

CBSD Test Labs Approved: Q2 2018

SAS Test Code Released: Q2 2018

CPI Training Program Accreditation: Q1 2019

For more on CBRS Status, please see https://cbrs.wirelessinnovation.org/cbrs-status-summary

Border Area Management

- Requirements on Implementing international agreements to protect Canada and Mexico

CBSD Measurement Reporting

- Initial requirements for CBSD measurements of their local interference environment and reporting those data back to the SAS.

CBSD Registration Processing

- The requirements for how a CBSD registers with a SAS, including owner registration, professional installer registration and CBSD registration.

Communications Security

- The communications security policies governing SAS and CBSD communications interfaces.

Certificate Authority Accreditation Standard

Certified Professional Installer Training Program Accreditation Standard

- Guidelines for adoption of uniform industry working standards and curriculum required to be consistent with the protection of spectrum, both licensed and GAA, for sharing in the 3550-3700 MHz band.

Note: Detailed feature list associated with each release is captured in the SSC CBRS Requirements Traceability Matrix (WINNF-SSC-0003)

CPE-CBSD Handshake

Domain Proxy

- The baseline Operational and Functional Requirements of the CBRS Domain Proxy for initial testing and trials.

Dynamic Protection Zones

Environmental Sensing Capability (ESC)

- The requirements for implementation of an Environment Sensing Capability, and protecting federal incumbents.

Exception Management

- The requirements for how trouble tickets or exceptions are managed, including from FCC input, reports from incumbents, and reports from PAL.

FSS Protection

Grandfathered Wireless Device Protection

Operations Security

- The overall system operational security requirements to include handling of incumbent data, obfuscation of spectrum data, and processes associated with auditing and governance of the SAS infrastructure.

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PAL Protection Area Definition

- Requirements on how PALs reports their coverage area to the SAS for end-to-end use of the licenses. This includes how PAL licensees define PAL Protection Areas (PPAs), request to operate in a particular geographic area within their license boundary (PPA), how PPA credentials and IDs are defined, conveyed and managed, and how the SAS accomplishes such protections.

Protocol Support for Priority Access Licensing

Propagation Modeling

- Identify appropriate 3.5 GHz propagation models for Incumbent and PAL protection and PPA definition, determine relative benefits and limitations, develop agreement on baseline needs such as underlying data, and define standardized interference aggregation methodologies.

SAS to SAS Information Sharing

- Initial support for SAS-SAS Synchronization and Information exchange.

Spectrum Grant Request Processing

- The requirements for how a CBSD requests and relinquish grants, and how grants are reassigned or terminated.

Release 1 Still In Development

PAL Operations Support

PAL Secondary Market Support

Note: These Specifications, if any, will have no impact on existing Release 1 specifications

Issue Management and Change Requests

Following the release of revision 1 specifications, change requests will be collected from the Forum's <u>public issues management portal</u>

Release 2

SG Policies for WG Implementation

There will be a mix of Release 1 and post Release 1 (Release 2, Release 3, etc.) participants in the ecosystem for the foreseeable future

- Note that Release 1 will include FCC changes to Part 96 as they occur

Release 1 is a default for Devices and SAS's

- Assure that all Entities "behave properly" when working in a mixed Release environment (SAS to CBSD, CBSD to SAS, SAS to SAS)
  - Release 2 entities are responsible for working with Release 1 entities
- Post Release 1 Specs should define default Behavior Appropriately

"Release 2" is not mandatory, but if you chose to move to Release 2, it includes a mandatory protocol update to allow feature discovery/capability exchange (for any Post Rel 1 SAS or CBSD) plus optional features

- Support for multiple release level and feature set operability
- Backward compatible with Release 1 -- Nothing Breaks when talking to Release 1 Entity

Capability Exchange will Support Selective Implementation of Release 2 Optional Features

- Devices and SAS's can determine Release level (Release 1 would just ignore) of "Partner"
- Devices and SAS's may inquire about Implemented Post Release 1 Features

Optional Release 2 Features are Severable (Standalone, Built on top of Release 1 if Possible)

(Most?) Specific Post Release 1 Features are Optional

The Set of Permitted Features is "Open" to Extension.

- SAS and CBSD Proprietary Features may be exchanged through the same interface as WInnForum approved features. However, the Feature ID of those Proprietary Features shall follow the standard naming convention as defined by WInnForum, to avoid conflict with standard features and other proprietary features.

Test and Certification of Release 2 to be worked out

- Certification may be against a specific profile to be defined by the steering group with a specific set of options mandatory for that profile

Notional Spec Tree

- Includes Implementing Protocol
- Testing TBD, based on Traceability Matrix,
- Desire for Feature by Feature and Severable: may have feature dependencies

Rel. 2 Mandatory Discovery Protocols w/ Industry Testing	Rel. 2 Option 1	Rel. 2 Option …	Rel. 2 Option N

Release 1 w/ FCC Testing (Mandatory)

Optional

Mandatory
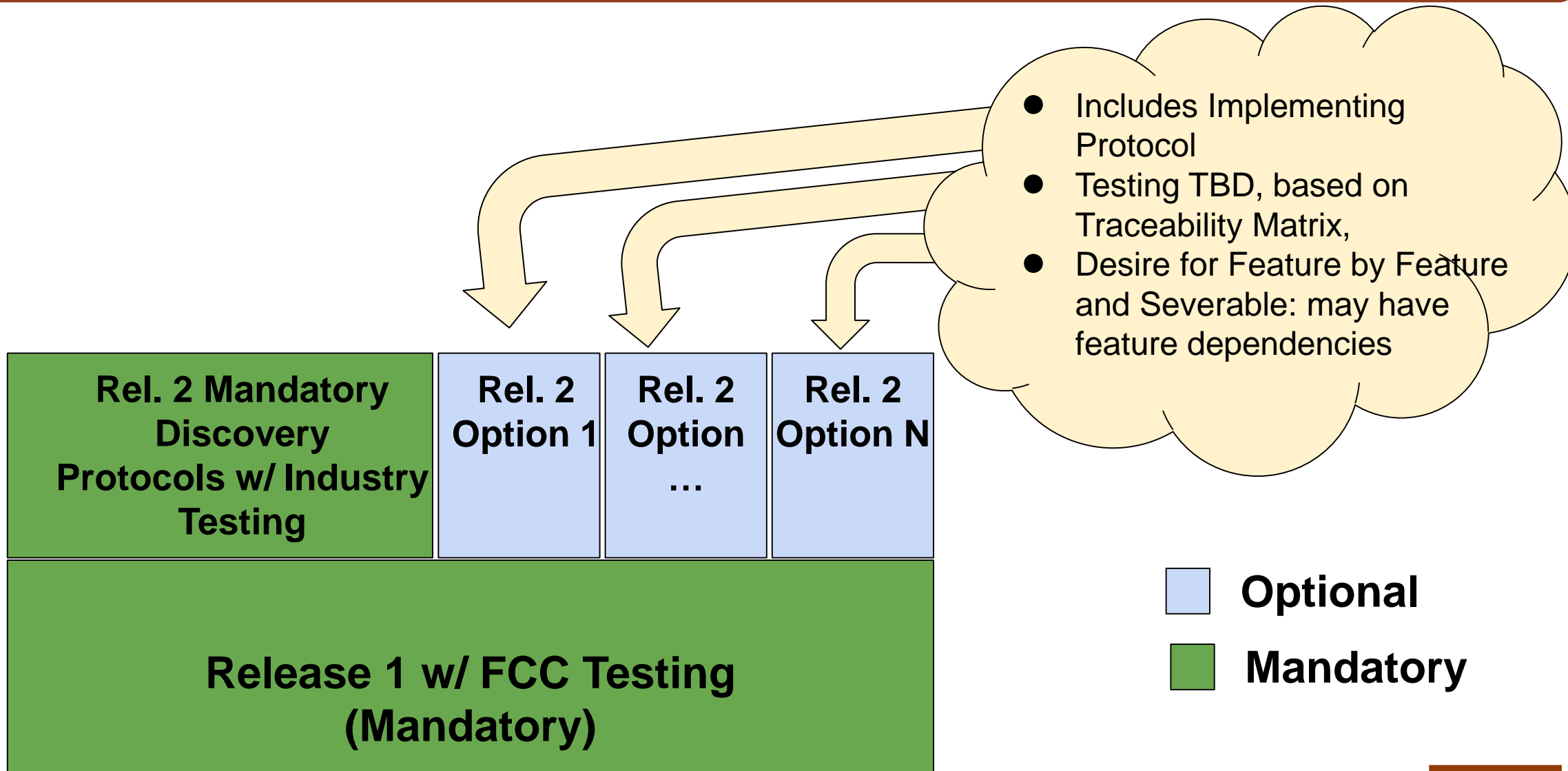
The WInnForum "Lean Standards Development Model (LSDM)™"

Architecture and Roadmap

Release 1
- Requirements Specification 1
- Requirements Specification 2
- Requirements Specification 3
- Protocol and API Specification 1
- Protocol and API Specification 2
- Test and Certification Specification 1

Release 2
- Requirements Specification 4
- ...
- Protocol and API Specification 3
- ...
- ...
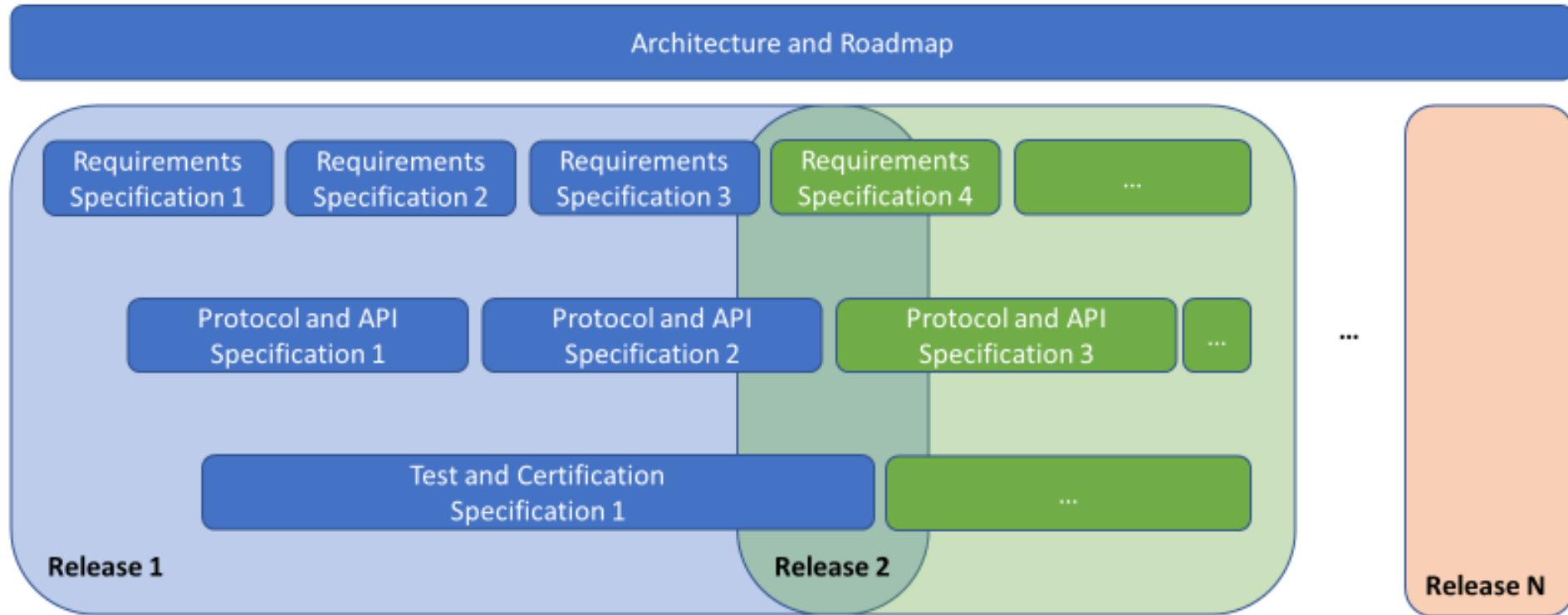
Release N

Backlog items are assigned to a "sprint"
Continual Feedback from deployment against Interim Releases establishes new backlog items
Major release comprised of one or more interim releases
Results: Standards Based Products deployed in months, not years

Current Plan for Release 2 Features and Status (Details in follow on slides)

Feature	Requirements (WG1)	Protocols (WG3)	Operations (WG5)	Test (WG4)
Capability Exchange	Complete	In Development	Not Applicable	In Development
Enhanced Group Handling	Complete	In Development	Not Applicable	In Development
Support for 1D and 2D Antenna Patterns	Complete	In Development	In Development	In Development
1D and 2D Antenna Patterns for PAL and Incumbent Protection	In Development	In Development	In Development	Introduced, Not Started
Indoor Penetration Loss	In Development	Introduced, Not Started	To Be Determined	Introduced, Not Started
CPE-CBSD Indicator	In Development	In Development	In Development	Introduced, Not Started
Enhanced CPE-CBSD Support for IAP	In Development	In Development	In Development	Introduced, Not Started
Enhanced Propagation Models	Introduced, Not Started	Not Applicable	Not Applicable	Introduced, Not Started
Flexible Grant Request	Not Applicable	In Development	Not Applicable	Introduced, Not Started
GAA Coexistence Support	In Development	In Development	In Development	Introduced, Not Started
Grant Update	To Be Determined	In Development	Not Applicable	Introduced, Not Started
Passive DAS Support	In Development	In Development	In Development	Introduced, Not Started
Registration Enhancements	In Development	Introduced, Not Started	To Be Determined	Introduced, Not Started
Support for Beamforming	To Be Determined	To Be Determined	To Be Determined	To Be Determined

Reminder: Release 2 will be active when the Capability Exchange feature has been completed. Release 2 will continually evolve as new features are added. An individual feature will be considered complete and available for adoption when the associated test has been balloted and approved.

Key
Not Applicable
Introduced, Not Started
In Development
Complete

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Capability Exchange

- Ability to exchange list of features supported.
- Mandatory to claim WInnForum Release 2 Compliance

Enhanced CBSD Group Handling

- Initially includes extensible grouping parameters and single frequency groups

Support for 1D and 2D Antenna Patterns

- Separate support for GAA

Indoor Penetration Loss

- Application of indoor penetration measurements to improve coexistence modeling

CPE CBSD Indicator

- Indicates to the SAS during registration if a device is a CPE-CBSD

Enhanced CPE-CBSD Support for IAP

Enhanced Propagation Models

- New propagation models to better support coexistence

GAA Coexistence Support

- SAS to SAS information exchange to facilitate improved GAA coexistence

Flexible Grant Request

Grant Update

- Existing Grant may be updated without relinquishing the Grant

Passive DAS Support

Registration Enhancements

- Re-registration/Registration update
- CPI Operations and CPI Training

Release 2 Policy Documents

WINNF-SSC-0009 Grouping Parameters Registration Policy

WINNF-SSC-0010 Registered Grouping Parameters

Self Testing is Being Considered for Features Not Impacting Part 96

- **Companies must agree to Policies and Procedures for Self Testing balloted and approved by the WInnForum members to claim "conformance" with WInnForum Standards for that feature, including:**
  - Agreeing to follow the test specifications defined by the WInnForum CBRS Test and Certification work group for the mandatory Release 2 procedures and for supported Release 2 optional features
  - Agreeing to use the WInnForum test harness developed by the WInnForum CBRS Test and Certification work group for supported features
  - Agree to submit, on company letter head, a signed letter to the WInnForum summarizing the testing for each feature, including the output of the test harness, if applicable, and indicating that all tests were passed

- **WInnForum will maintain a public website detailing which products are compliant with which feature**

- **Will start with Feature-by-Feature case, but may later move to feature bundle profiles**

- **interoperability testing in addition to the self Testing**
  - Not required as part of certification
  - Entities might require that as part of their business agreement