Introduction to the FiRa Consortium

February 4, 2020

UWB TECHNOLOGY

Our vision is to provide seamless user experiences using secured fine ranging and positioning capabilities of interoperable UWB technologies.

Our Vision

UWB Transforms Connectivity Experiences

With superior sensing and positioning capabilities

	Smart Home and Enterprises	Smart Cities and Mobility	Smart Transportation	Consumer	Smart Retail	Industry 4.0 and Healthcare
 **Hands-Free Access Control**	• Residential access control • Restricted enterprise access	• Parking garage • Vehicle digital key (standardized by CCC)	• Rider identification (private transport services)	• Logical access control	• Unmanned store access	• Barrier-free and restricted access control
 **Location-Based Services**	• Employee mustering in emergencies	• Bike sharing	• Ride sharing • Reserved seat validation	• AR gaming	• Indoor navigation • Foot traffic and shopping behavior analytics	• Asset tracking • Patient tracking
 **Device-to-Device (Peer-to-Peer) Applications**	• Conference systems	• Drone-controlled delivery • V2X*, autonomous driving	• Ticket validation (public transport services)	• VR gaming and group play • Find someone nearby	• Targeted marketing • Tap-free remote payment	• Proximity-based patient data sharing • Find equipment

*Connected Vehicle-to-Everything Communication

UWB Differentiators

Secure
Integrity of distance result due to PHY layer encryption

Real Time
Refresh rate of 200~1000 times/second

Co-Existent
Support bands different from Bluetooth/Wi-Fi

Reliable
Immune to narrowband fading or jamming

Accurate
Centimeter resolution in dense multipath environments

Low Energy
Ultra short air time

Interoperability and Ecosystem Matter

"Developing an open ecosystem is essential to providing enhanced user experiences".

"Market adoption of UWB technology will propagate only through standards-based interoperability".

APPLICATIONS

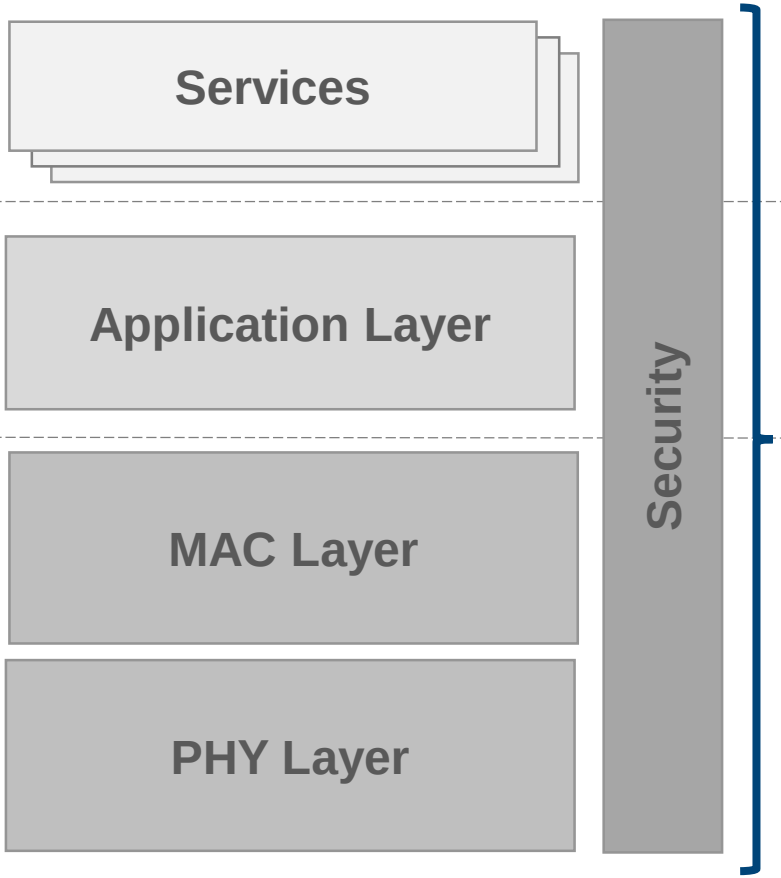
Drive For Interoperability At All Levels

Existing Standards

IEEE 802.15.4/4z

Enhanced UWB PHY & MAC

- Coding and preambles
- Improved integrity and accuracy
- Information elements
- Multiple ranging methods



FiRa Consortium

Service-specific protocols for multiple verticals

- Hands-free access control, location-based services, and device-to-device (peer-to-peer) applications

Mechanisms which are not within IEEE scope

- Discover UWB devices and services
- Configure devices in an interoperable manner
- Specify interoperable security requirements

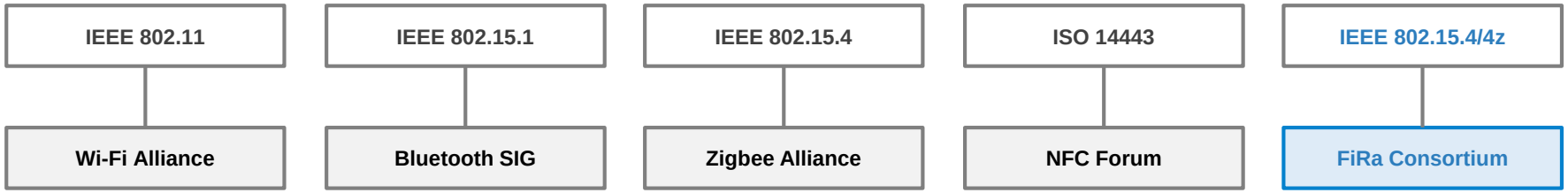
Interoperability Standard

- Profiled features among 802.15.4/4z PHY/MAC
- Performance requirements
- Test methods and procedures
- Certification program

Mission: Develop Use Cases and Guarantee Interoperability

Provide the missing blocks for a broad UWB ecosystem deployment

- Develop use cases based on IEEE 802.15.4 enhanced ranging technologies;
- Develop specifications and a certification program to ensure interoperability among chipsets, devices and solutions;
- Promote UWB ecosystems and enable new business opportunities delivering better user experiences; and
- Establish the FiRa Consortium as the reliable and trusted UWB technology brand that is adopted by the market.

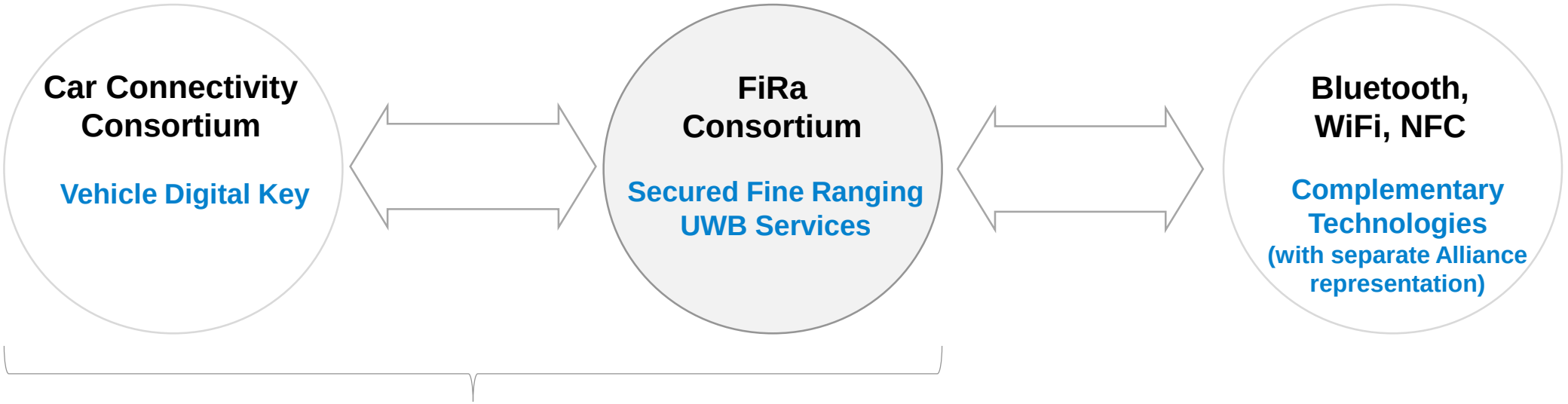


*Detailed goals of the FiRa Consortium are described in the Appendix.

Ready to Collaborate With Other Consortia

Providing Full Framework for UWB-Based Services

(Other connectivity complements IEEE 802.15.4)



Providing Full Coverage of Vertical Services

(FiRa Consortium complements Car Connectivity Consortium)

Why Join the FiRa Consortium?

Participation in the Consortium provides Member Companies the opportunities to directly engage in creating a broad UWB ecosystem that will benefit all members.

As a FiRa Consortium member, your company will have an opportunity to:

- Influence industry trends around the use of UWB technology for a variety of applications
- Be actively involved in defining UWB technology standards
- Enable products / solutions with UWB technology via early access to technical details
- Certify products as interoperable, providing customers with confidence in their choice of products and/or solutions
- Exhibit thought leadership in the expansion of the UWB ecosystem
- Participate in a variety of marketing related activities, helping to promote your company
- Develop new sources of revenue from the sale of FiRa Consortium certified UWB technology enabled products

Join the Initiative and Create An Open Ecosystem

Current Sponsor Members

ALLEGION PIONEERING SAFETY
ASSA ABLOY
BOSCH Invented for life
Decawave
HID
NXP
SAMSUNG

New Members

See Full List at
www.firaconsortium.org/about/members

Key Stakeholders

- Chip Manufacturers
- Device Manufacturers
- System Integrators
- Service Providers
- Technology Providers
- Test Tool Developers
- Test Labs

Contact Us

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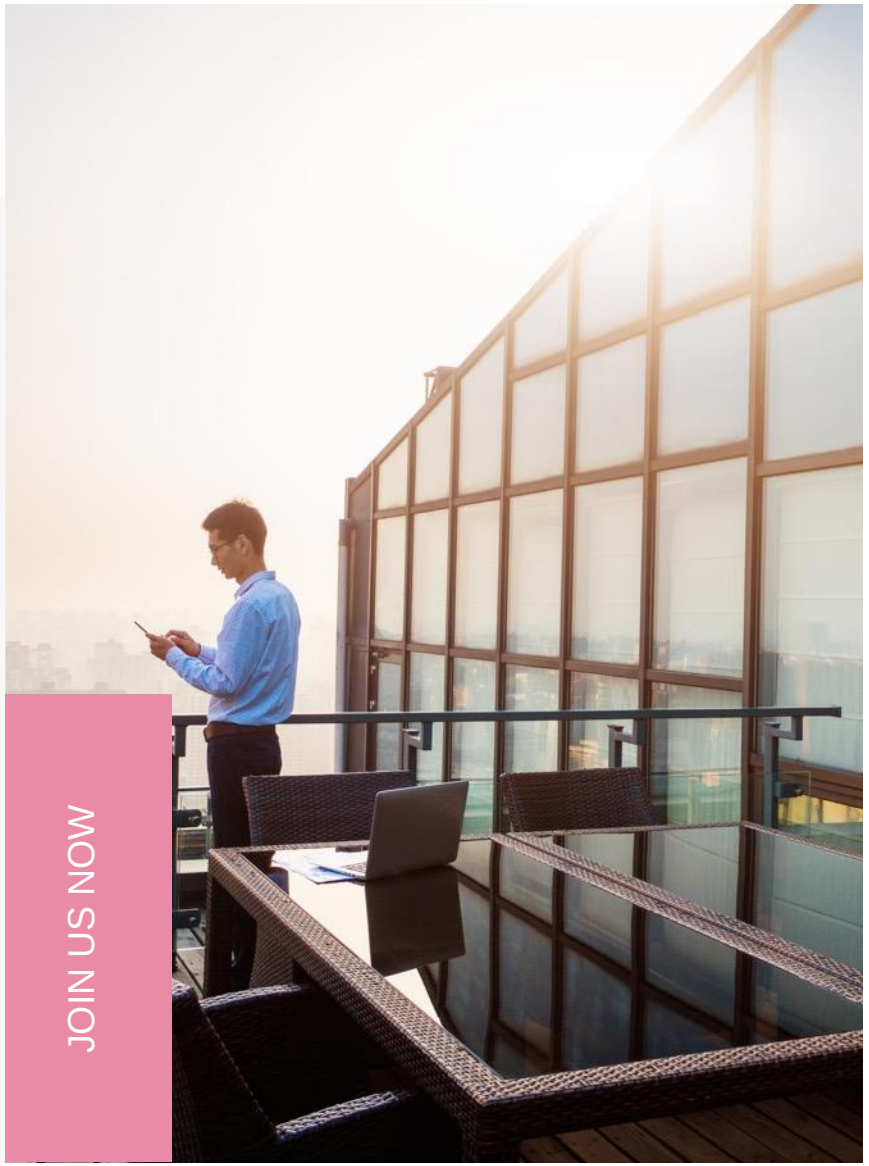


Appendix

01.

VISION, MISSION AND GOALS

Understand the vision, mission and goals of the FiRa Consortium

02.

LEGAL INFORMATION

Review high level overview of FiRa Consortium Bylaws and IPR Policy

03.

MEMBERSHIP

Learn about membership in the FiRa Consortium

04.

ORGANIZATION STRUCTURE

See how the FiRa Consortium is organized

01. Vision, Mission and Goals

Vision	• Provide seamless user experiences using secured fine ranging and positioning capabilities of interoperable UWB technologies
Mission	• Develop use cases based on IEEE 802.15.4 UWB ranging technologies • Develop specifications and certification program to ensure interoperability among chipsets, devices and solutions • Promote UWB ecosystems and enable new business opportunities delivering elevated user experiences • Establish FiRa Consortium as the reliable and trusted UWB brand that is adopted by the ecosystems
Goals	• Develop UWB use case scenarios across various vertical business domains • Develop Test Specifications for UWB PHY/MAC based on IEEE 802.15.4 standards • Develop Technical and Test Specifications for UWB Services (apart from and complementary to digital key for car access) • Liaise and collaborate with related consortia working on complementary technologies to enable UWB use cases • Organize interoperability test events • Develop and operate Certification programs for UWB PHY/MAC and Services • Develop and promote a Brand and Logo for Certified products and solutions • Collaborate with Government and Regulatory bodies to encourage UWB deployments • Promote UWB technology to industry players • Promote UWB use cases to end users

02. Overview of IPR Policy

- Applicable to all Members and Member Representatives
- Governs the ownership, licensing, and treatment of intellectual property that is contributed to, generated by, or necessary for the implementation of standards developed as part of the FiRa Consortium activities
- Subject to the specific terms of the IPR Policy, in general:
  - Members (and their Related Parties) commit to license their Necessary Claims on RAND (Reasonable and Non-Discriminatory) terms, but may opt to provide RAND-Z (RAND with Zero royalty) terms by submitting a written declaration form
  - Members that did not participate in the applicable development group may withhold a license to Necessary Claims by submitting a written declaration form
  - New incoming members must agree to license Necessary Claims for all final Standards, and have 60 days to decide if they will do so for draft Standards
- Patent calls before technical meetings
- No obligation to conduct patent searches for Necessary Claims

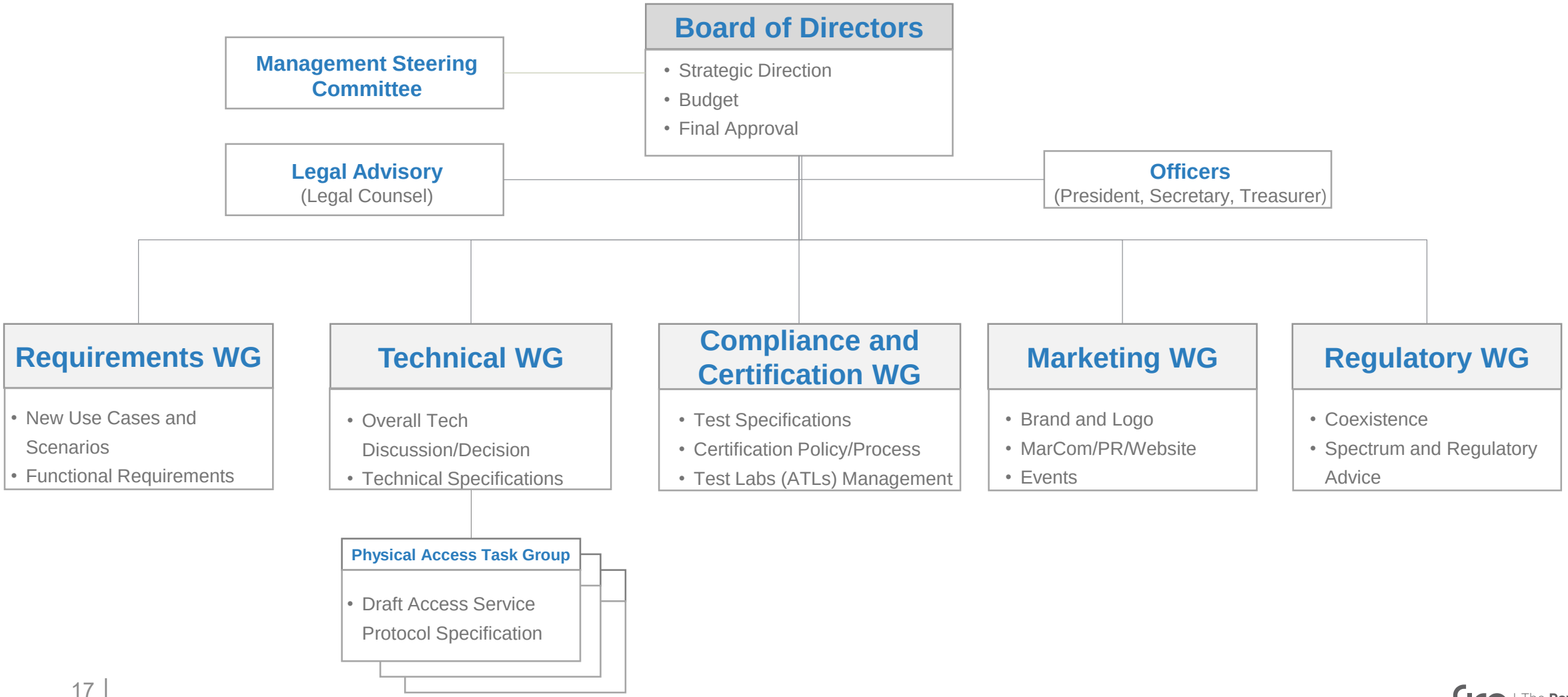
02. Overview of Bylaws

- The Bylaws establish the rules governing the operations of the organization, including the rights of members, rules for meetings and corporate actions, voting and quorum requirements, and other matters
- Delaware non-profit corporation with 6 classes of membership
  - Sponsor, Contributor, Associate, Adopter, Test Lab and Academic & Educational
- Directors: Sponsor members each designate 1 Director and up to 2 alternates
- Officers: 2 year term, elected by Board of Directors, compensation possible
- Board of Directors establishes Member Committees, Working Groups, Task Groups, sub-committees, special interest groups, etc.
- Indemnification and insurance possible for Directors, Officers, employees and agents

03. Membership

	Sponsor	Contributor	Associate	Adopter	Test Lab	Academic and Educational
Board of Directors	√					
Working Group Leadership	√	√				
Working Group Voting Rights	√	√				
Working Group Participation	√	√	√		Compliance & Certification WG only	√
Access to Final Specifications	√	√	√	√	√	√
Certify Products	√	√	√	√		
Apply for Authorized Test Lab					√	
Annual Membership Fee (USD)	$80K	$50K	$30k	$15K (if revenue ≥ $50M) or $5K (if revenue < $50M)	$5K	$2.5K (one time only)

04. Organization Structure

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The Power
to Be Precise
THANKS