10-Year Vision

Standards will be increasingly and critically important to communications and networking!

- This area of human life is exceptionally hungry for innovation.
- The emerging trend is to shorten the time to market for new emerging technologies. This trend puts a pressure on compressing the research-to-standards transition time for core technologies.
- This trend can be only supported by significant participation of Industrial and Academic Researchers in the standardization of emerging technologies.
- The compressed development cycles for an ever increasing volume of emerging technologies and standards will require enormous resources, mass ingenuity, and extremely high intellectual potential.
- This can be achieved effectively by deploying massive resources of global Open Source communities.
Scope of the SBB WG

- To discover for IEEE standardization opportunities in emerging technologies
- Assess the present Networking Technologies Standardization landscape and produce a long-term vision for Future Networks and related technologies standardization
- Partner with technology roadmap teams in building the visions and roadmaps for the standardization components of their specific technology areas

The first edition:
- Presented a standardization landscape picture for 5G and beyond technologies and a hypothetical roadmap for selected core technologies that could enable autonomous technology and standardization dynamics

2nd edition:
- Present future generation network standardization landscape in a stand alone SBB chapter while the Standardization Building Blocks for specific technologies will be integrated into the technology roadmap chapters
Today’s Landscape - Open Source vs SDOs
Today’s Landscape – Key Words!
Top Needs for 10-year Vision

- A significant amount of **standardization** of **emerging technologies** in early phases of technology evolutions.
- An **environment** where Industrial and Academic researchers can contribute to standardization.
- **Shortened development cycles** for core technologies and implementation of standards
Challenges and Solutions to Meet Needs

- **Need:** A significant amount of standardization of emerging technologies in early phases of technology evolutions.
  - **Solution:** Bring/deploy industrial and academic researchers into standardization

- **Need:** An environment where Industrial and Academic researchers can contribute to standardization.
  - **Solution:** Create an ecosystem comparable with researchers’ modus operandi

- **Need:** Shortened development cycles for core technologies and implementation of standards
  - **Solution:** Deploy more resources with high ingenuity and intellectual potential in open source development methodology
Ecosystem for Innovation and Standardization

Technology Timeline

Conceptual:
- Concept is born
- Socialized mostly in a closed circle of experts
- No convincing proof of concept
- No investment
- Often a “skunk project”

Pre-competitive:
- Proof of concept
- No Business Model
- Risk investment
- Academic exercise
- Pet project

Competitive:
- Proven - It works
- Proprietary business models
- Talk of the town
- Academics’ paradise
- Good investment
- Funded project
- A dream-default standard

Deployment:
- Hot stuff
- Race to market
- Rush standards
- Industry forums
- Marketing hype
- Compliance testing
- Analyzing technology
- 20/20 hindsight papers
**Ecosystem for Innovation and Standardization**

**Intellectual Property**

- **Conceptual Phase**
  - Concept is born
  - Socialized mostly in a closed Circle of experts
  - No convincing proof of concept
  - No investment
  - Often a “skunk project”
  - Broad patent claims
  - Highly cited papers

- **Pre-competitive Phase**
  - Proof of concept
  - No Business Model
  - Risk investment
  - Academic exercise
  - Pet project
  - Strong patent claims
  - Well cited papers

- **Competitive R&D**
  - Proven - It works
  - Proprietary business models
  - Talk of the town
  - Academics’ paradise
  - Good investment
  - Funded project
  - A dream-default standard
  - Mostly implementational

- **Deployment**
  - Hot stuff
  - Race to market
  - Rush standards
  - Industry forums
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  - Compliance testing
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Ecosystem for Innovation and Standardization

Technology Relevance

- **Conceptual Phase**
  - Concept is born
  - Socialized mostly in a closed Circle of experts
  - No convincing proof of concept
  - No investment
  - Often a “skunk project”
  - Broad patent claims
  - Highly cited papers

- **Pre-competitive Phase**
  - Proof of concept
  - No Business Model
  - Risk investment
  - Academic exercise
  - Pet project
  - Strong patent claims
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- **Competitive R&D**
  - Proven - It works
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  - A dream-default standard
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- **Deployment**
  - Hot stuff
  - Race to market
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  - Compliance testing
  - Analyzing technology
  - 20/20 hindsight papers
Ecosystem for Innovation and Standardization

Emerging Technologies and Standards

Emerging Technology Standards help to create and drive Markets
Market Driven Standards respond to the needs of the market, enable Markets
Ecosystem for Emerging Technologies Standardization

- Technical Communities
- Academic Conferences
- Industry Events
- Professional Magazines
- Scholarly Journals
- Citable Standards Contributions
- TechRxiv Publications
- OpenFog
- Open Source Communities
- Industry Alliances
- Standards Activities
- Core Technology SDOs
- Global System SDOs
- Industrial Research Labs
- Governmental Funding Agencies
- Academic Institutions
The SBB Team partners with technology roadmap teams in creating the technology vision for standardization and the roadmaps to get there.

- Cross-team meetings and interactions took place with a number of teams and more are planned.
The SBB Team’s Proposed Approach

- Standardization vision and roadmap for each technology track depends on each team’s approach to the treatment of the problem
- Technology Roadmaps can be augmented by SBB overlay if it presents an autonomous picture for the Tack vision that is not clipped by limiting dependencies
- SBB Team appeals to technology tracks to generate an autonomous framework for their vision.
- If a framework is not possible to create for the entire technology track, then we recommend to consider fragmenting the problem stace into macro-elements and define architectural framework for each of them
- SBB team can then help to create a complimentary Standardization vision harmonized with the framework and/or for associated building blocks
- Basic standards can be of the following types: Frameworks, Reference Architectures, Functional architectures, etc.
Highlights of some cross-team collaborations

- Collaboration with Apps and Services WG produced a standardization project for a functional architecture for smart cities (IEEE P1950.1)
- This standard enables an independent dynamics for a smart city long-term vision, technology roadmap and associated standardization overlay
- This standard will definitely spin off various related standards projects
- Satellite Group from start has a vision for the architectural standard as once again illustrated in their presentation in this series
- System Optimization Team is susceptible to a fundamental architectural treatment of the problem space
- Massive MIMO team is receptive to this approach
Stakeholders

Global System Integrator SDOs
Core technology SDOs
Technology suppliers
Standards developers

Industry Alliances
Industry practitioners
Industrial and Academic researchers
Open Source Communities

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Get involved!

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QUESTIONS?