IEEE Future NETWORKS

Enabling 5G and Beyond

International Network Generations Roadmap (INGR) Virtual Workshop

Standardization Building Blocks

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IEEE

10-Year Vision

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

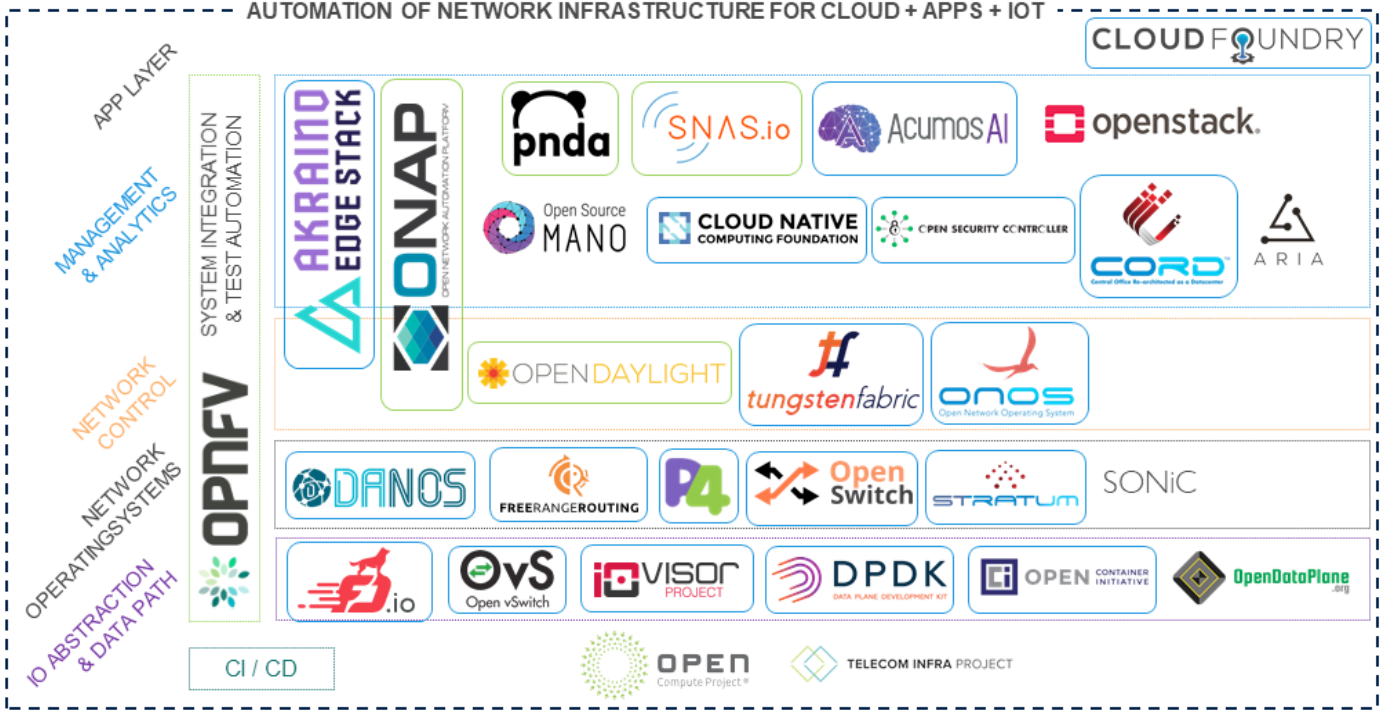
- This area of human life is exceptionally hungry for innovation.
- The emerging trend is to shorten the time to market for new emerging technologies. This trend puts a pressure on compressing the research to standards transition time for core technologies.
- This trend can be only supported by significant 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 IEEE standardization opportunities in emerging technologies
- Assess the present Networking Technologies Standardization landscape and the long-term vision for Future Networks and related technologies
- Partner with technology roadmap teams in building the visions and roadmaps for the standards components of their specific 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 standards 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

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

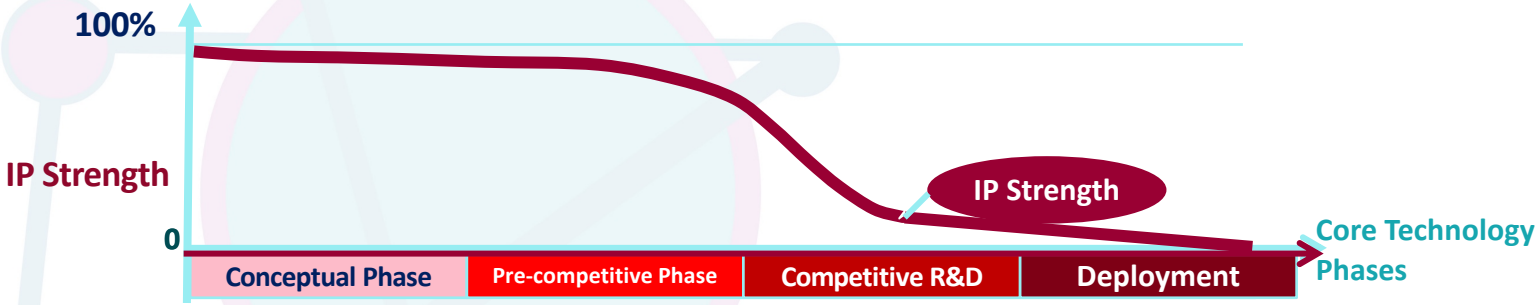
- Proof of concept
- No Business Model
- Risk investment
- Academic exercise
- Pet project

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

- 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



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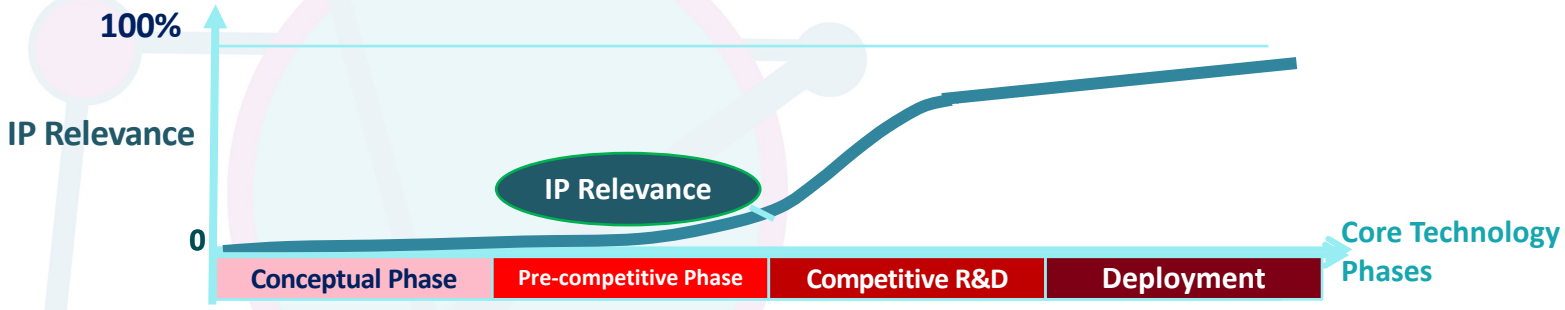
Ecosystem for Innovation and Standardization

Technology Relevance



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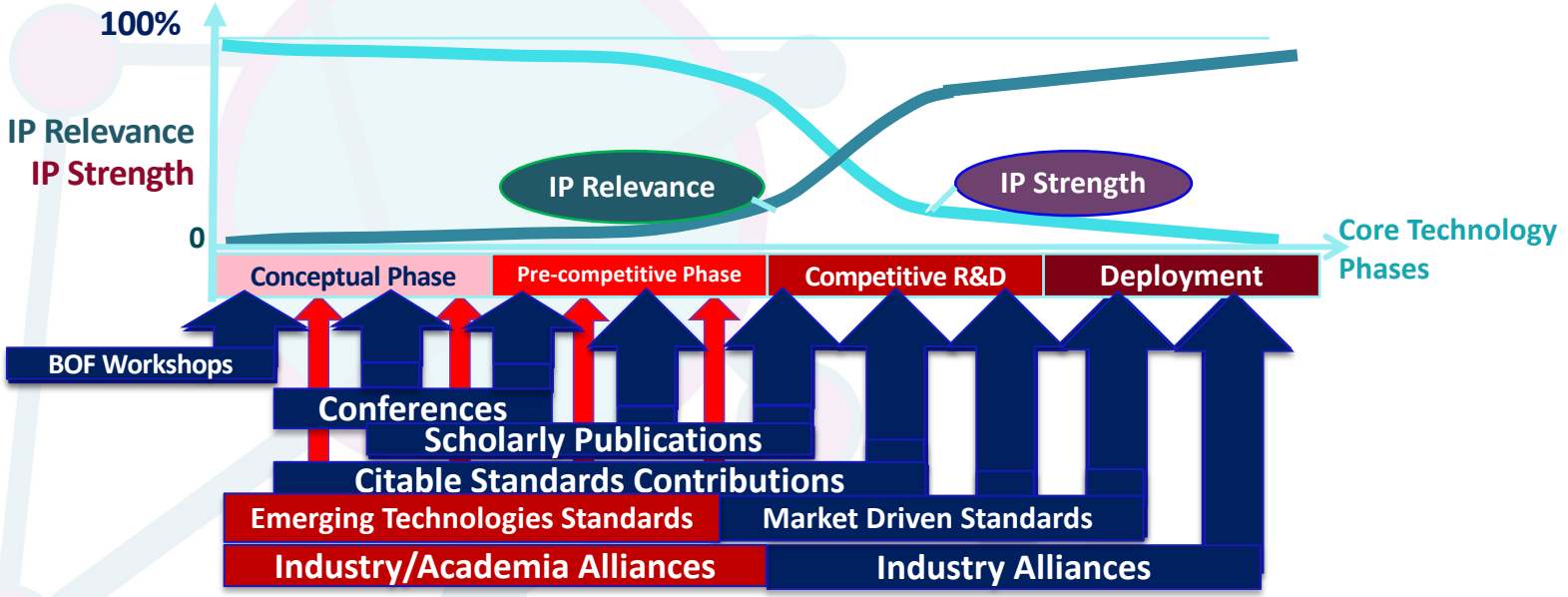
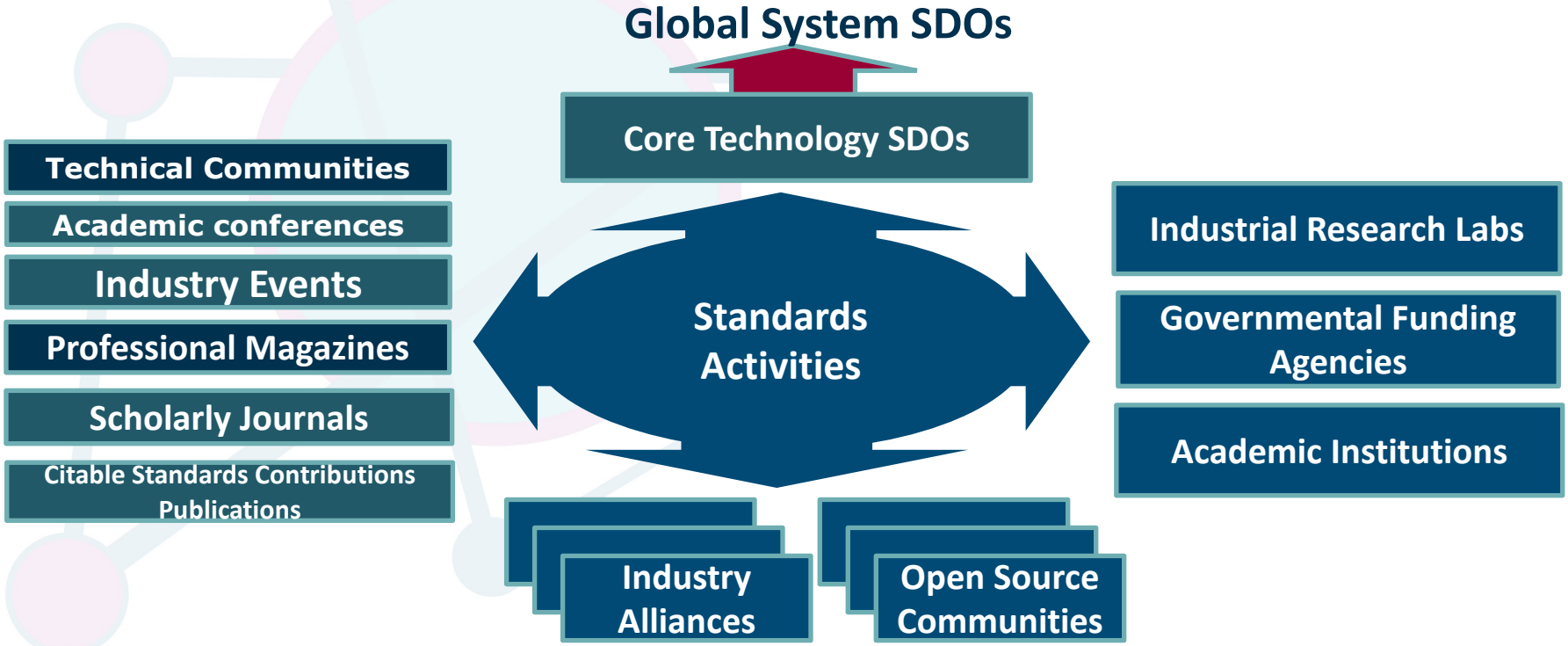
Ecosystem for Innovation and Standardization

Emerging Technologies and Standards



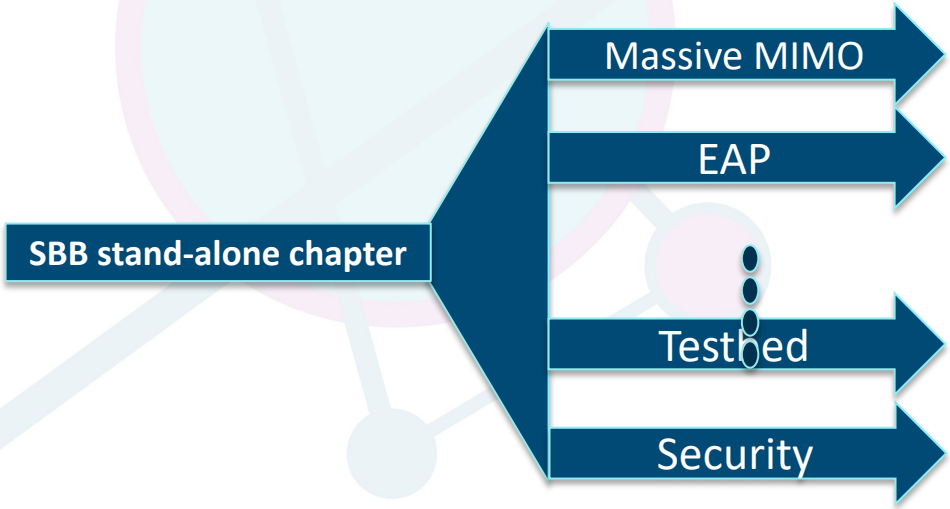
Emerging Technology Standards help to Create Markets, drive Markets
Market Driven Standards respond to the needs of the market, Enable Markets

Ecosystem for Emerging Technologies Standardization



Standardization Building Blocks in Technology Roadmaps

- The SBB Team will partner with technology roadmap teams in creating the technology vision for standardization and the roadmaps to get there.



- Initial cross-team meetings took place with teams indicated in the figure.
- Others are pending.

Illustration of a model cross-team collaboration

- 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 technology roadmap and standardization
- This standard will definitely spin off various related standards projects

Stakeholders

Global System Integrator SDOs
Core technology SDOs
Technology suppliers
Standards developers

Industry Alliances
Industry practitioners
Industrial and Academic researchers
Open Source Communities

Contributing Working Group Members

- Mehmet Ulema
- Alex Gelman
- Reinhard Schrage
- Scott Mansfield
- Ranganai Chaparadza
- Muslim Elkotob

Get involved!

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QUESTIONS?