

India EU Stakeholders Workshop on 5G Technology Landscape

5G Interoperability and Test Beds

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5G Interoperability and Test Beds

The Buenos Aires Declaration (WTDC-17) has recognised that widespread conformance and interoperability of telecommunication/ICT equipment and systems can:

- increase market opportunities
- Increase competitiveness and reliability
- encourage global integration and trade.

The emphasis on importance of Interoperability as recognised by WTDC requires an environment for conformance and interoperability testing. The setting up of Test Bed will facilitate and enable this requirement.

5G Test Beds: Significance

- India is today among the world's biggest telecom markets, and its citizens look to the broadband and digital revolutions to leapfrog on developmental goals ranging from education and skilling, financial inclusion, healthcare, trade in goods and services, among several others.
- However, such a huge and vital market cannot be serviced relying largely on imported systems. India too must be a major player in the global telecom technology ecosystem, contributing intellectual property, telecom products and designs, and services.
- A strong telecom manufacturing base and vibrant startup ecosystem, backed by cutting-edge R&D in academia and industry, as well the attendant standardization, certification and security assurance support systems, are vital.

Worldwide 5G Test Beds

- METIS Project Testbed (Mobile and wireless communications Enablers for Twenty-twenty (2020) Information Society)
- 5G Lab Germany (TU Dresden)
- ORBIT, USA
- 5G Test Network Finland (5GTNF)
- 5G Innovation Centre UK (University of Surrey)
- EuWI (European Laboratory of Wireless Communications for the Future Internet)
- 5G Experimental Facilities (University of Bristol, UK)
- Many more...



Need of 5G Test Bed in India

- To be at the forefront of 5G developments and deployments
- Test Bed plays an important role in providing insight into:
 - ❖ 5G technology
 - ❖ Use Cases
 - ❖ Deployment challenges

Need of 5G Test Bed in India

- 5G Test Beds act as a catalyst for 5G ecosystem. Their functions include:
 - ❖ To promote interoperability and thus avoid market fragmentation
 - ❖ Fostering innovation in 5G use cases
 - ❖ Showcasing applications
 - ❖ promote entrepreneurship to develop locally tailored solutions
 - ❖ to stimulate market engagement.
- The Indigenous 5G test-bed will enable Indian industry to make the next leap to global scale manufacturing, and India's nascent startup ecosystem to produce a few successful game-changing products.

Indigenous 5G Test Bed in India



IITB



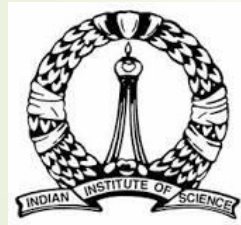
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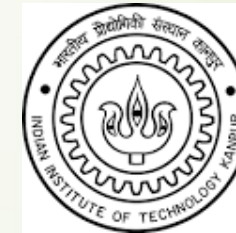
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DoT has approved financial grant for the project which envisages setting up of end-to-end Open 5G Test Bed for Indian companies & academia in distributed architecture model

'Indigenous 5G Test Bed' in India

- The consortium of these academic institutes have been at the forefront of 4G and 5G research leading to IPR and contributions to standards.
- Many of its members have also designed and built telecom products in collaboration with industry that have been deployed successfully. Key Indian telecom product design houses and manufacturers are also partnering in the proposed effort.
- By building from scratch the new 5G technology components that go into the test-bed, which are currently being designed and built elsewhere in the world by the major players as well, the consortium is seeking to simultaneously create the base for industry to launch cutting-edge 5G products globally.



Major Goals of the Indigenous 5G Test Bed

- Providing an open test bed to validate products, prototypes and algorithms
- Boost Product Design and Manufacturing in India for 5G technologies
- Encourage telecom product startups in India
- Multiply R&D capability to develop 5G based solutions for Indian markets



Major Goals of the Indigenous 5G Test Bed...

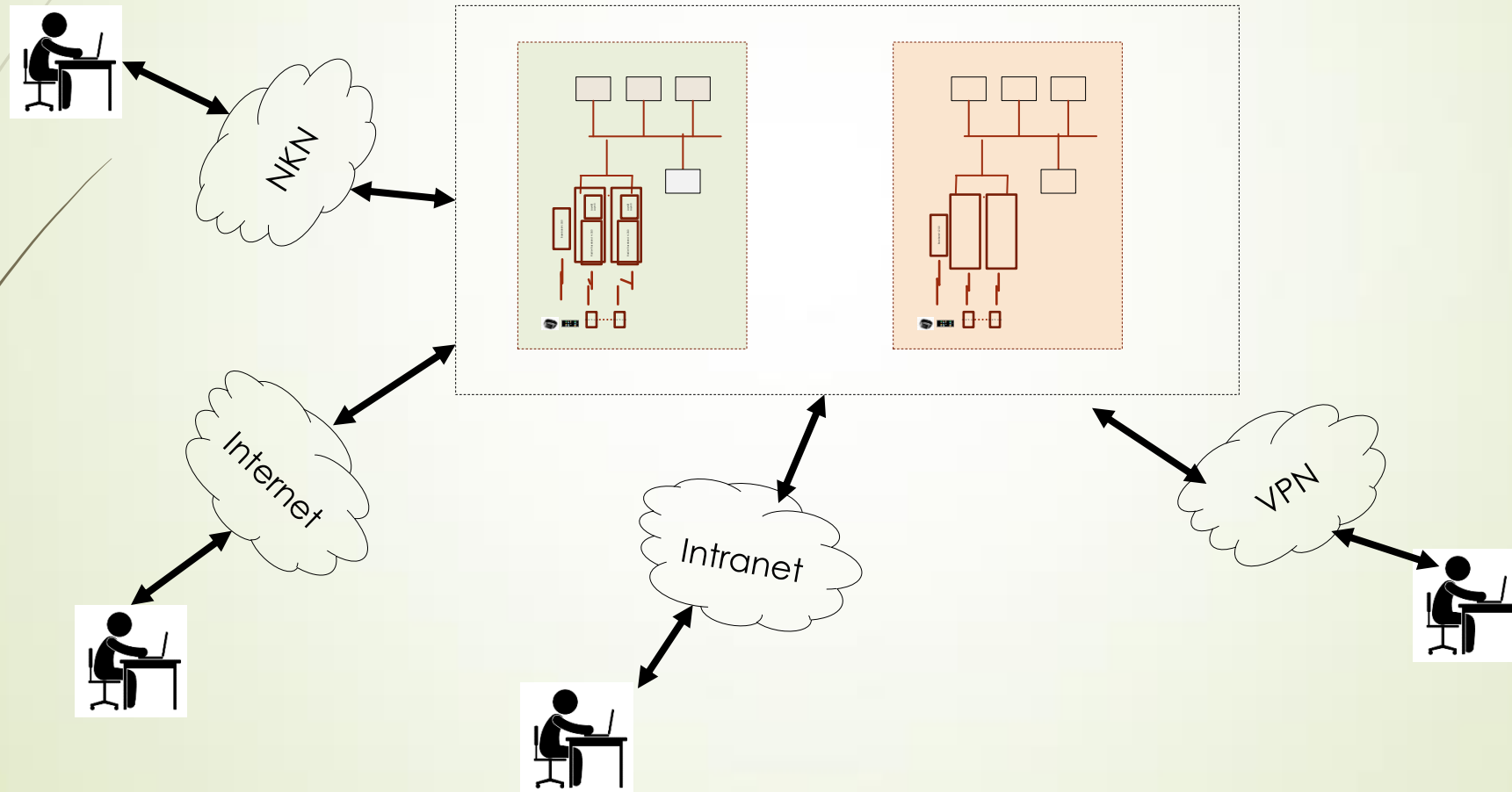
- Demonstrate solutions for India
 - ❖ For Rural network deployments
 - ❖ Smart city applications
 - ❖ Dense Urban broadband, “wireless fiber” for spurs
- Hugely enhance capacity in 5G technology skills
- Increase India’s participation in global forums (3GPP, ITU, IEEE) and present test results for Indian use cases
- Testing security and privacy aspects.

Test Bed Setup - Connectivity

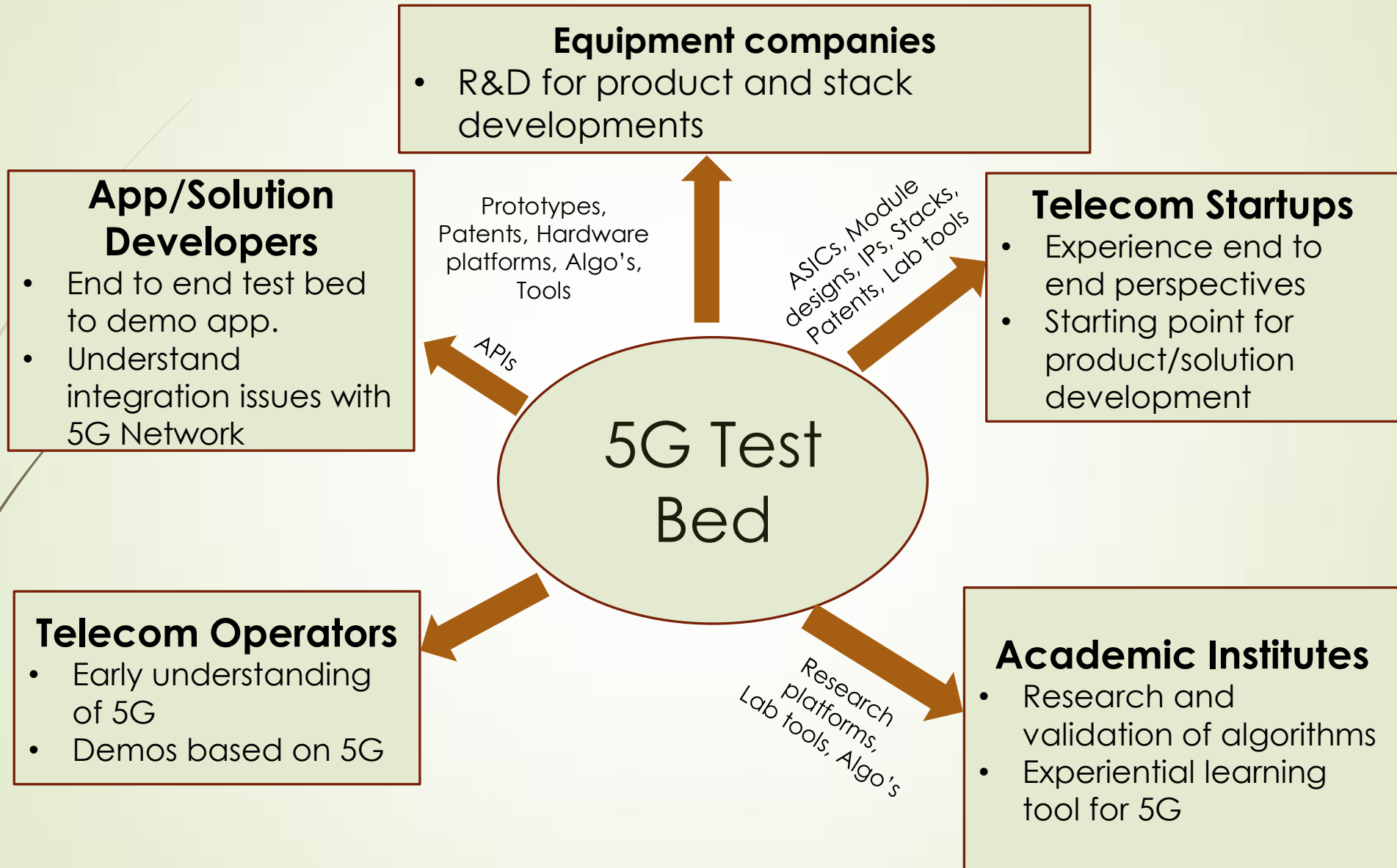
- All of the components will be integrated seamlessly in a multi-locational test-bed connected through the National Knowledge Network.
- The test bed will be open to all registered users for testing their products, algorithms, and applications.
- Unlike proprietary test-beds built , the indigenous 5G test bed will enable and provide support for any user to plug in their components even deep inside a subsystem, with open published interfaces and technical support for integration.

Test Bed Setup - Connectivity

- Test bed access from anywhere :
 - ❖ Access to high speed links to connect to the network
 - ❖ Institutes can connect over NKN (National Knowledge network)



5G Test Bed Users



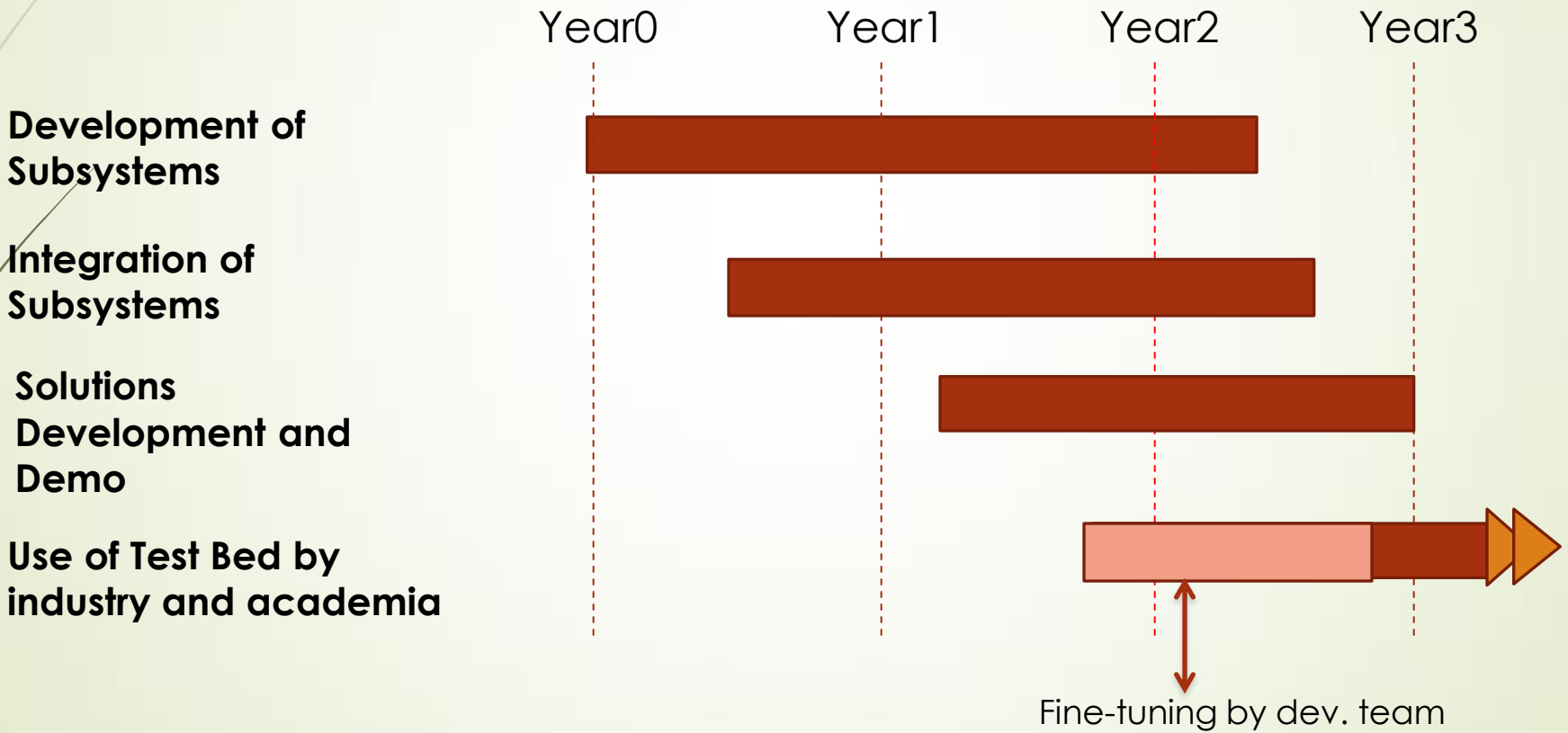
5G Test Bed Users...

- India today has but a handful of telecom product startups. One of the aims of the test-bed is to also enable an entire new clutch of such startups to be founded.
- It is anticipated that several of the young engineers who work on the development of the new 5G technologies will spin out startups. All the participating academic institutions have thriving incubation ecosystems which can provide support to such startups.
- Test-bed itself will be invaluable to Startups for proving and validating their products. Once this is done, the time and cost of certification/validation from accredited labs, where such is needed, can be capped to affordable levels.

Timelines of 5G Test Bed

Project Duration: **3 Years**

(Test bed will be usable from later part of development period)



5G Test Bed Deployment Strategy

- The Test Bed will be realized in stages over 4 versions.
- Version 0 will be ready by May, 2019 : to validate all the hardware design components and the base on which the other versions will be built
- Version 1 will be ready by January, 2020.
- Version 2, which will have most of the functions of the Test bed, will be ready by September, 2020.
- Version 3 (Final Deliverable) will be ready by April, 2021

Indigenous 5G Test Bed: Expected Outcome

- The investment in the proposed test-bed will serve multiple objectives. It will :
 - ❖ enhance national capability in telecom technology
 - ❖ Help create a state-of-the-art 5G test bed for all to use to validate their products and solutions
 - ❖ develop indigenous Intellectual Property (IPR) that can be licensed by the academic institutes to companies and startups
 - ❖ Provide the test setups and development platforms for startups and companies to leverage and reduce their time and cost to market and
 - ❖ Give fillip to Indian telecom manufacturers



Thank You