



**SITRAER 2015**  
AIR TRANSPORTATION SYMPOSIUM  
São José dos Campos, SP, Brazil  
October 26 - 28, 2015



# The Forum of Information Technology for Air Traffic Management

*Li Weigang*

XIV SITRAER, ITA, São José dos Campos – SP, Brazil

October 26-28, 2015

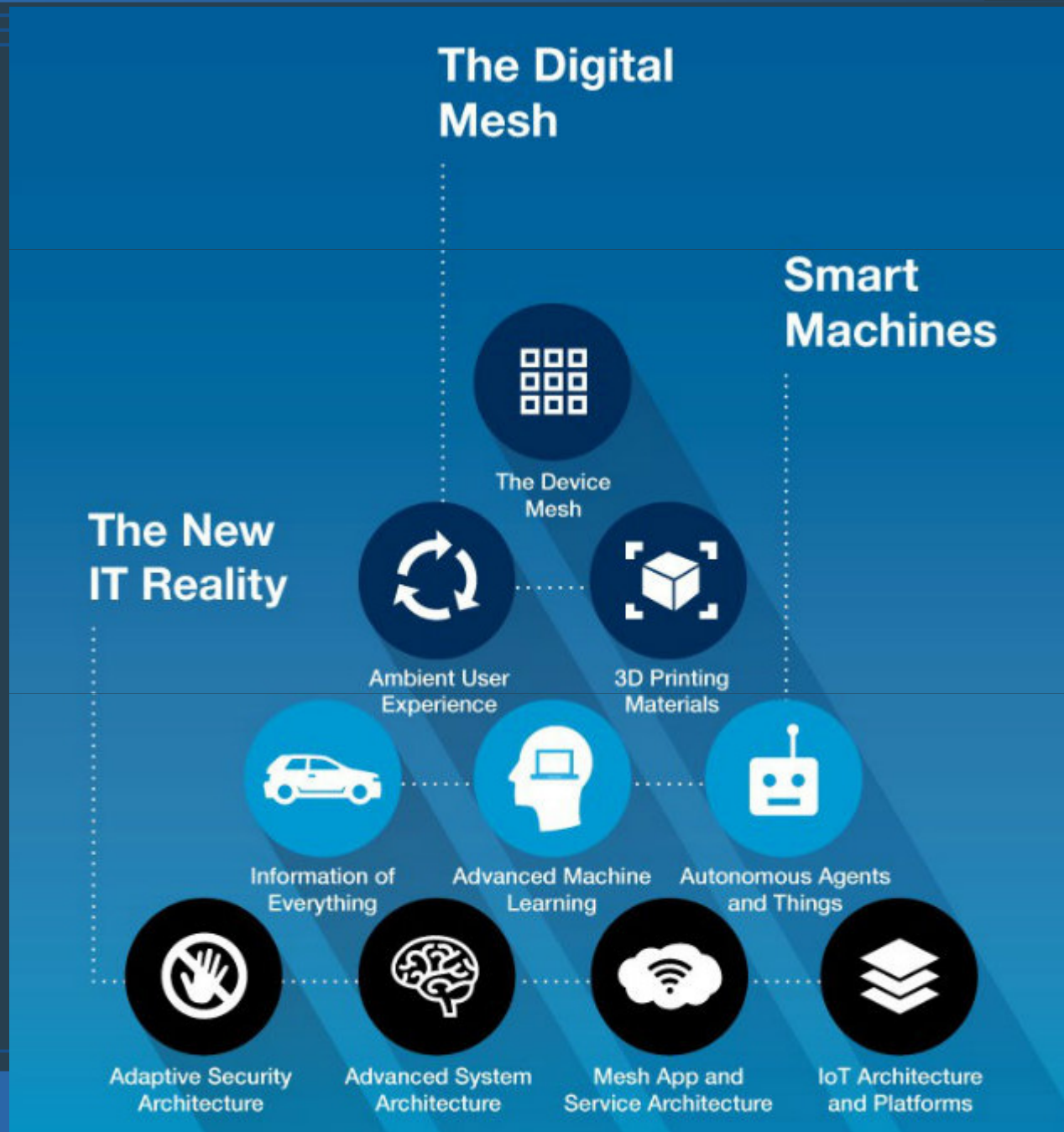
# Agenda of the Forum



- 09h20min - Dr. *Jeffery D. Musiak* - BR&T Brazil
- Boeing Information Technology Management for Air Traffic Management
- 09h50min - Dr. *Ítalo Oliveira* - GE Technologies
- Applications Big Data Analytics in Air Transport
- 10h50min - Mr. *Sérgio Martins* - SAAB
- Remote Tower
- 11h20min – 1oTen Esp *Marcelo Mello Fagundes* - DECEA
- BRAZIL SIRIUS: advances and research opportunities
- 13h30min - Dr. *Fabio Kawaoka Takase* - ATECH
- ATM - Challenges of Innovation
- 14h00min - Cap Eng *Leonardo Marini Pereira* - ICEA
- GBAS technology in Brazil



# Gartner's Top 10 IT Trends for 2016



# Information of Everything



Everything in the digital mesh produces, uses and transmits information. This information goes beyond textual, audio and video information to include sensory and contextual information. Information has always existed everywhere but has often been isolated, incomplete, unavailable or unintelligible. Advances in semantic tools such as graph databases as well as other emerging data classification and information analysis techniques will bring meaning to the often chaotic deluge of information.

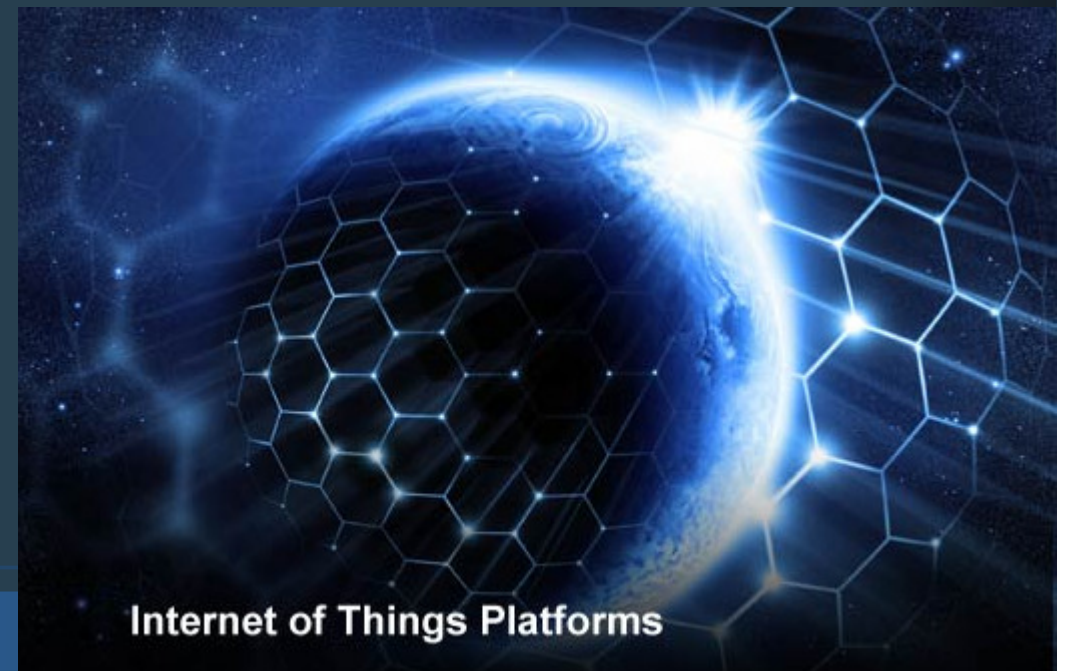




# Internet of Things Platforms



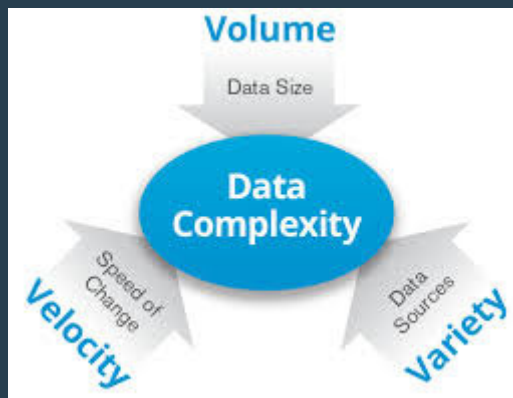
IoT platforms complement the mesh app and service architecture. The management, security, integration and other technologies and standards of the IoT platform are the base set of capabilities for building, managing and securing elements in the IoT. IoT platforms constitute the work IT does behind the scenes from an architectural and a technology standpoint to make the IoT a reality.



# Advanced Machine Learning



In advanced machine learning, deep neural nets (DNNs) move beyond classic computing and information management to create systems that can autonomously learn to perceive the world, on their own. DNNs (an advanced form of machine learning particularly applicable to large, complex datasets) are what make smart machines appear "intelligent."



Advanced Machine Learning

# Autonomous Agents and Things













Smart machine implementations includes robots, autonomous vehicles, virtual personal assistants (VPAs), **unmanned aerial vehicle (UAV)** and smart advisors — that act in an autonomous (or at least semiautonomous) manner. While advances in physical smart machines such as robots get a great deal of attention, the software-based smart machines have a more near-term and broader impact. VPAs such as Google Now, Microsoft's Cortana and Apple's Siri are becoming smarter and are precursors to autonomous agents.





# FAA NextGen Programs



 <b>ADS-B</b>	 <b>Data Comm</b>	 <b>ERAM</b>	 <b>NAS Voice System</b>	 <b>PBN</b>
The NextGen successor to radar	The future of controller-pilot communication	The next generation computer system for en route air traffic control	Increases the power and flexibility of controller-pilot voice communications	More precise routes and procedures that save time, fuel and emissions
 <b>TAMR</b>	 <b>SWIM</b>	 <b>Safety</b>	 <b>Decision Support Systems</b>	 <b>Environment</b>
Upgrades and standardizes the next generation computer system for terminal air traffic control	NextGen's digital data delivery backbone	Enhancing the world's safest aviation system	NextGen tools that help controllers to work more efficiently and effectively	Reducing aviation's environmental footprint

The **Next Generation Air Transportation System (NextGen)** is a new National Airspace System due for implementation across the United States in stages between 2012 and 2025. NextGen proposes to transform America's air traffic control system from a ground-based system to a satellite-based system.

# NextGen Programs: ADS-B & CATMT



Automatic Dependent Surveillance-Broadcast (ADS-B) is FAA's satellite-based successor to radar. ADS-B makes use of GPS technology to determine and share precise aircraft location information, and streams additional flight information to the cockpits of properly equipped aircraft.



Collaborative Air Traffic Management Technologies (CATMT) is a suite of enhancements to the decision-support and data-sharing tools used by air traffic management personnel. These enhancements will enable a more collaborative environment among controllers and operators, improving efficiency in the National Airspace System.

# NextGen Programs: Weather & SWIM



NextGen Weather will help reduce weather impact by producing and delivering tailored aviation weather products via SWIM, helping controllers and operators develop reliable flight plans, make better decisions, and improve on-time performance. NextGen Weather is accomplished through collaboration between FAA, NOAA and NASA.



System Wide Information Management (SWIM) is the network structure that will carry NextGen digital information. SWIM will enable cost-effective, real-time data exchange and sharing among users of the National Airspace System.

# NextGen Programs: Data Comm & NVS



Data Communications (Data Comm) will enable controllers to send digital instructions and clearances to pilots. Precise visual messages that appear on a cockpit display can interact with an aircraft's flight computer. Offering reduced opportunities for error, Data Comm will supplant voice communications as the primary means of communication between controllers and flight crews.



National Airspace System Voice System (NVS) will supplant FAA's aging analog voice communication system with state-of-the-art digital technology. NVS will standardize the voice communication infrastructure among FAA facilities, and provide greater flexibility to the air traffic control system.

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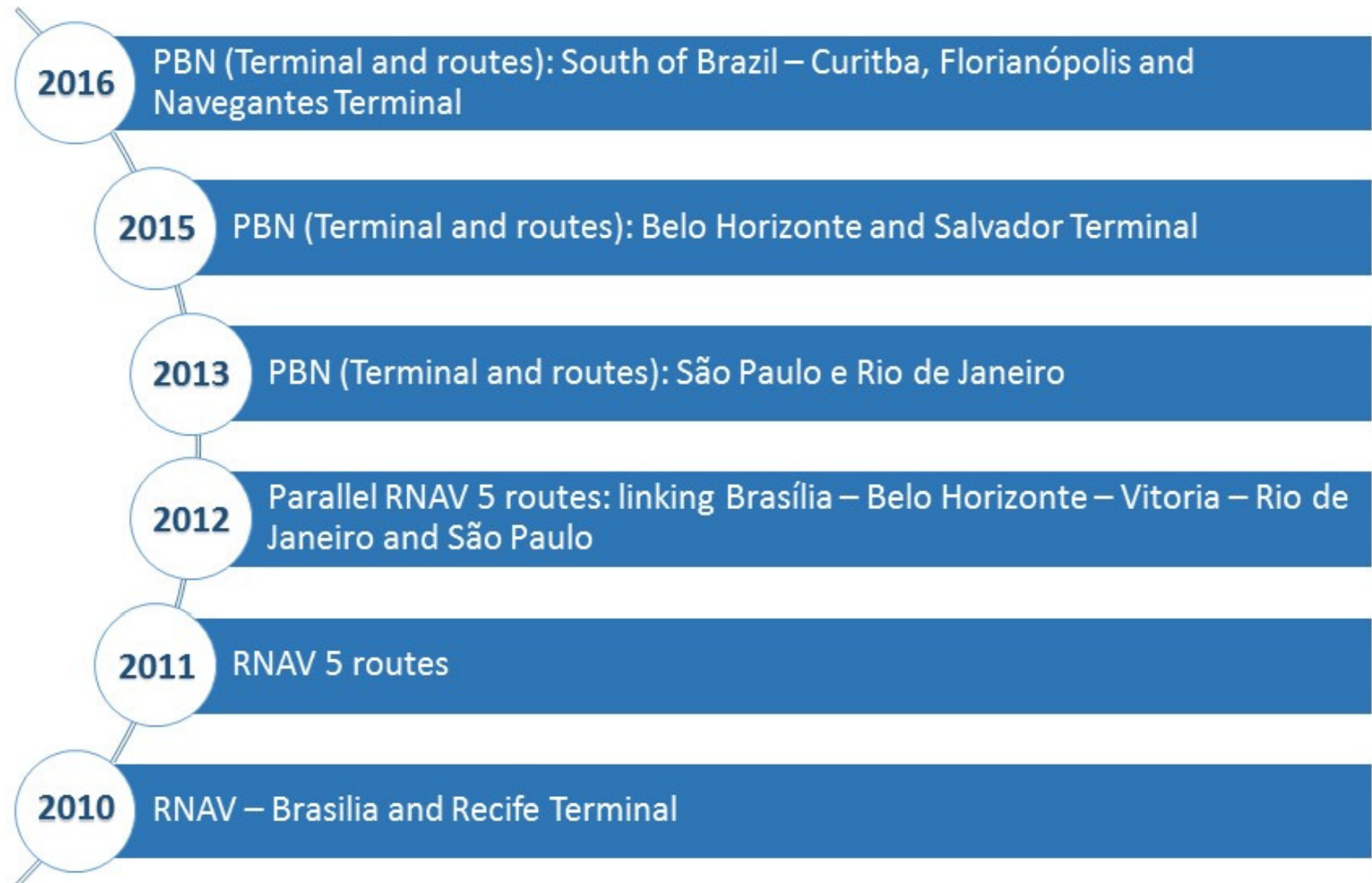
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# DECEA Program: Brazil SIRIUS



SIGMA : Apoio ao CDM





Collaborative Trajectory Options Program (CTOP) Given airspace constraints how to achieve a better fluency flow considering capacity, improving business goal results for National Airspace System (NAS) users and make possible to apply reroute and reduce delay together.



4D Efficient Flight Path (4D EFP) The 4D trajectory concept is based on the integration of time into the 3D aircraft trajectory. It aims to ensure flight on a practically unrestricted, optimum trajectory for as long as possible in exchange for the aircraft being obliged to meet very accurately an arrival time over a designated point.

# Forum of IT for ATM, SITRAER 2008







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# OBRIGADO!

# Thanks!

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