



a  MICROCHIP company

# The Future of Time

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Microsemi Frequency and Time

# What is the Future of Time?

- Leading indicators
  - ITU Standards
  - Customer Requirements
  - Product Roadmaps
  - New Applications
  - Innovations born out of Defense Industry
- Top 10 Predictions
- Disclaimer
  - The predictions expressed here are opinions.
    - They may be right
    - They may be wrong



# Prediction #1

- Time Keeps Ticking (and slipping) into the Future
  - Leap Second
  - GPS Week Rollover

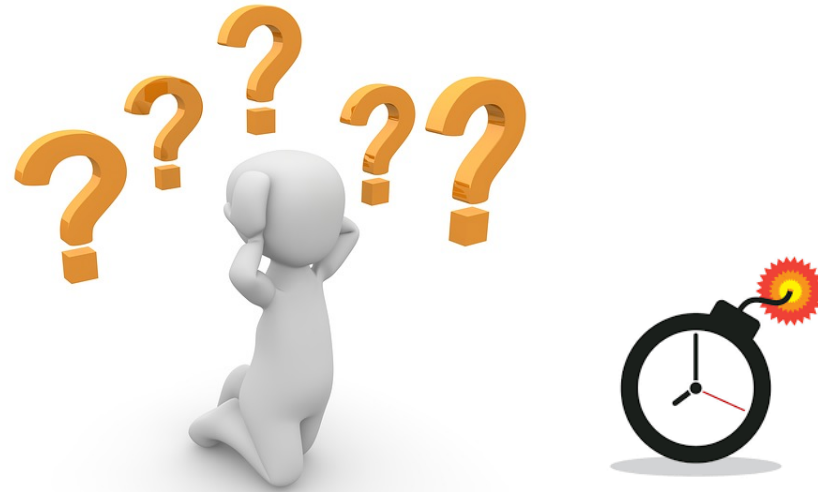
April 2019						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

**Saturday, Apr 6th 2019**

- Awareness
- Investigation
- Research
- Plan
- Implement
- Test

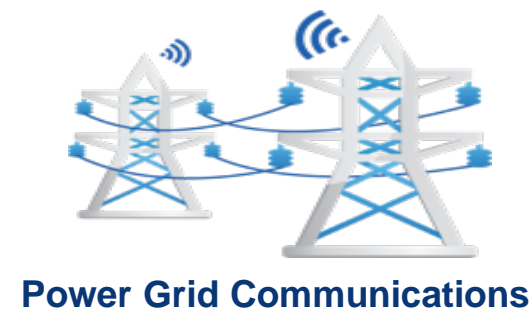
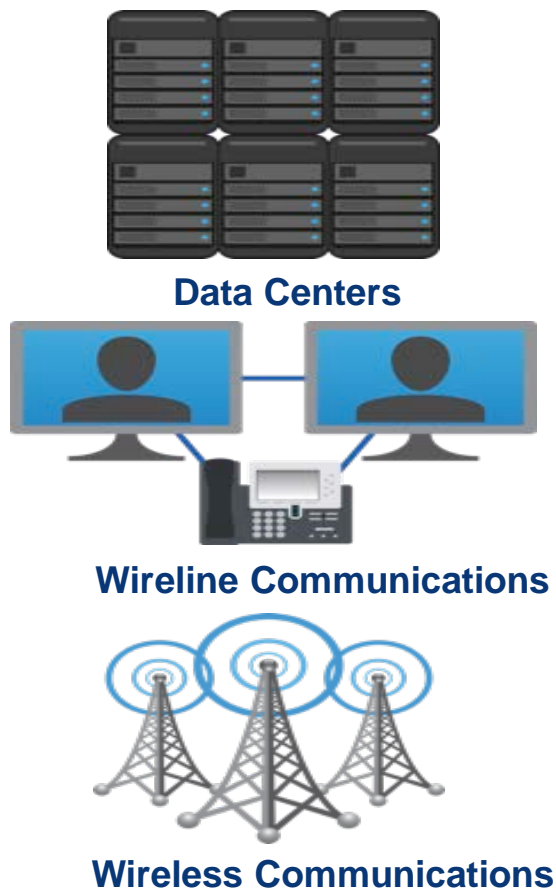
# Predictions #2, 3

- Timing Experts Will Continue to Age
  - Merger & Acquisition Activity Will Continue
- } Awareness May Be Compromised



# Prediction #4

- Critical Infrastructure Will Require Increasingly Accurate, Secure & Reliable Time



# Prediction #5

- New Applications Will Drive Timing Requirements
  - 5G and beyond
  - Micropositioning
  - Real time monitoring with IOT devices
  - Smart Cities
  - Autonomous Vehicles
  - Who knows what's next?



# Prediction #6

- Technology & Specifications Born Out of Defense Industry Will Become Useful to Commercial Markets – Again!
  - Tighter timing requirements
  - SWAP
  - Ability to operate in GNSS denied environments
  - Ability to operate in harsh environments



# Predictions #7, 8

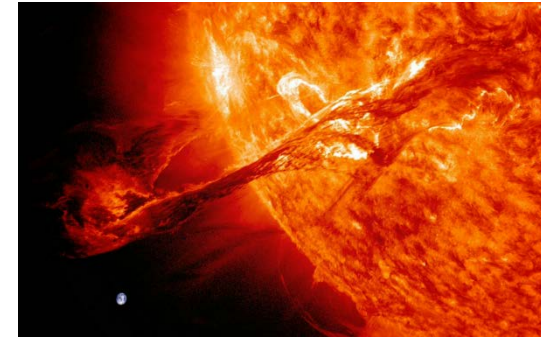
- **Timing Hygiene** will evolve from recommended best practice to requirement.
  - Security
    - Validated timing signal source
    - Trusted supply chain
  - Resiliency
  - Visibility
- Similar to quality of service SLAs and data security assurance, timing accuracy and resilience will serve as value added differentiators for service providers.





# Predictions #9, 10

- The risk of GNSS interference will continue, and likely increase.



- New alternate & complimentary sources of time will become commercially available. Some entities are doing this on their own for risk management. After years of talking about it, eLORAN is poised for a comeback.

# How Can We Impact The Future Of Timing?

- Awareness
  - Government support and sponsorship
  - Industry support
- Education
  - Training
  - University programs
  - Internships
  - Mentoring
  - Succession plans for everyone in this room!





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