*Because every life has a **purpose**...*

MSA
The Safety Company

Cloudy with a Chance of RIOTs

Towards an Open Industrial Internet

Michael Frey – 2nd RIOT Summit – 29th September 2017

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Agenda

- Background
- Towards an Open Industrial Internet
- Summary

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Background

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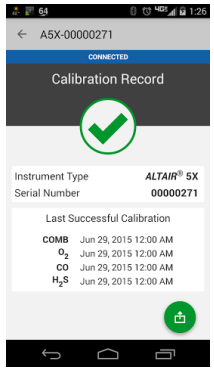
About

- Senior Software Developer at MSA
  - previously: contractor @ swie, technical lead @ mesh:ine, research assistant at HU berlin, …
- Focus at MSA: Information-Centric Networks for the Industrial IoT
- MSA and RIOT have a history!

MSA Safety - Mission and Products

- Improve **worker's** and **facilities safety**
- Main customer segments
  - Oil, gas, chemical industries
  - Fire fighters and first responders
- Core product groups
  - **Gas detection**
  - PPE and SCBAs
  - Fall protection



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Towards an Open Industrial Internet

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Motivation

- (Industrial) Devices become more and more connected
  - Networking is mostly (for now) a “nice-to-have” feature, particularly safety-wise
  - Industry is cautious about new technology (with side-effects)
  - “If it is not usably secure, it’s not the internet-of-things”
    - insecure devices/technology hurt adaption
    - releasing inherently broken devices is a “death sentence”

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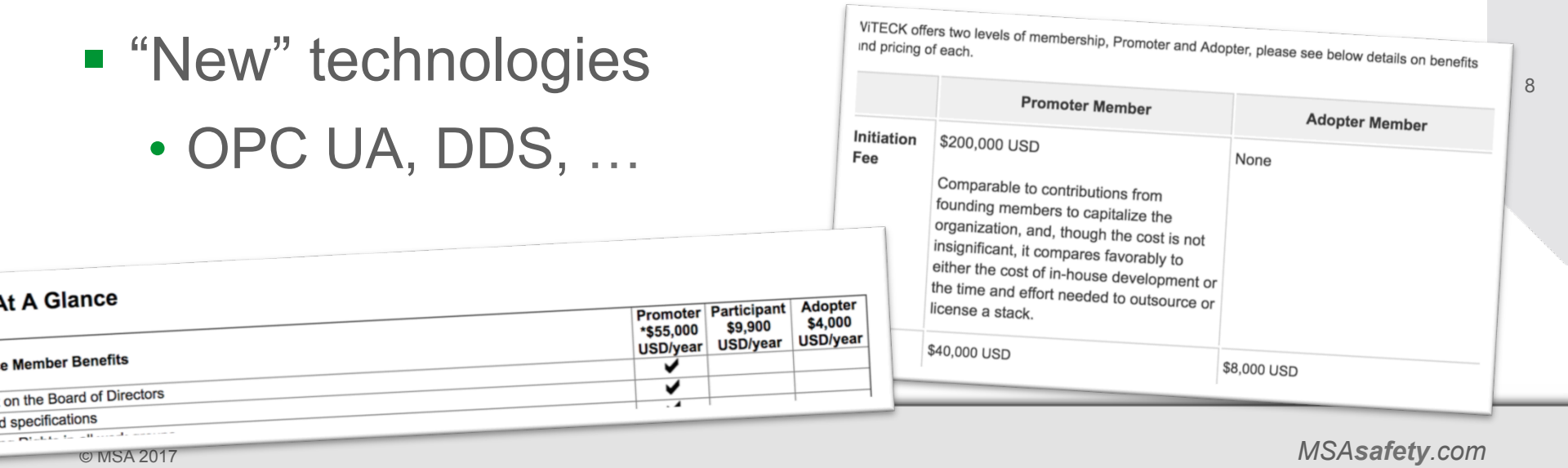
Related Work (aka “The glorious past”)

- Field Buses, i.e.
  - HART (1989) and WirelessHART (2007)
    - Wireless Industrial Technology Konsortium (WiTECK) provides WirelessHART stack
      - ♦ no license fee for hardware products
      - ♦ license fees for “object code” products
- “New” technologies
  - OPC UA, DDS, …



ViTECK offers two levels of membership, Promoter and Adopter, please see below details on benefits and pricing of each.

	Promoter Member	Adopter Member
Initiation Fee	$200,000 USD Comparable to contributions from founding members to capitalize the organization, and, though the cost is not insignificant, it compares favorably to either the cost of in-house development or the time and effort needed to outsource or license a stack.	None
	$40,000 USD	$8,000 USD

At A Glance

e Member Benefits	Promoter *$55,000 USD/year	Participant $9,900 USD/year	Adopter $4,000 USD/year
on the Board of Directors	✔		
d specifications	✔		

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What are the (preferable) requirements?

- “Technologies” should be
  - open in terms of
    - standardization
    - access to specifications
    - implementation(s)
  - secure
- Provide interoperability (no small island solutions)
- Close cooperation with research **and** industry

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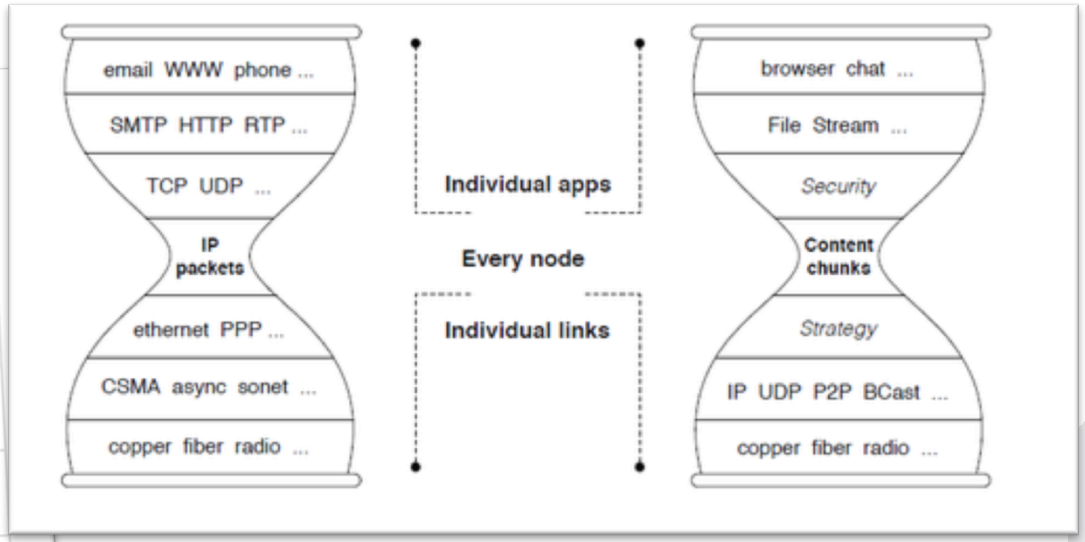
Towards an Open Industrial Internet

application	CoAP, HTTP
transport	UDP, TCP
IP/routing	IETF RPL
adaptation	IETF 6LoWPAN
medium access	IEEE802.15.4e
phy	IEEE802.15.4-2006



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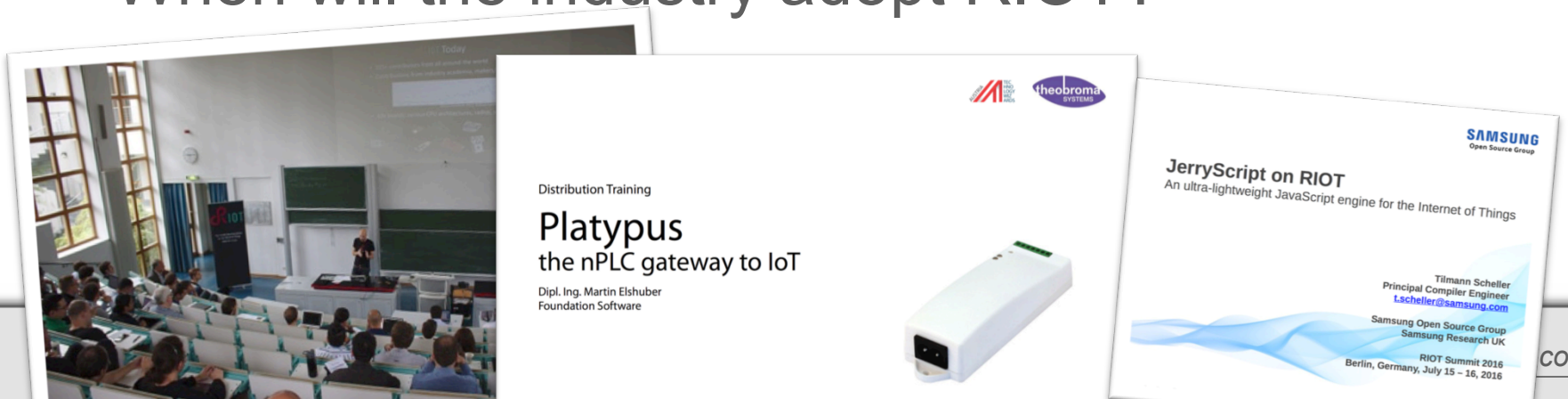
RIOT

- RIOTs close ties to research makes it an early adaptor to many (new) technologies
- “Pole position” for many, exciting, and new technologies
- API stability is a concern
- Rewrites of rewrites?
- When will the industry adopt RIOT?



Intermezzo: MSA + RIOT

- RIOT was internally evaluated by MSA in 2015
- Evaluation wasn't that bad, but competition is tough
- Many products at MSA require components which hold certain certifications
  - SIL, ATEX, and MISRA compliance
- "Raising eyebrows" about timers in RIOT
- No "commercial support"

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Summary

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Summary

- RIOT is primarily used in research efforts at MSA
- Providing resources for RIOT certification(s) was a topic, but not in the near distant future
- ICN has the potential to become a core technology in future products
- Secure (and reliable) industrial devices are the key-factor for the success of an industrial IoT

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we are hiring

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Thank you! Any Questions?

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