

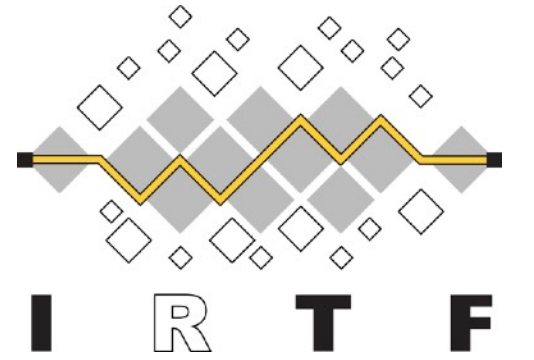
# T2TRG: Thing-to-Thing Research Group

Interim meeting, January 30th, 2025, Online  
Chairs: Carsten Bormann & Ari Keränen

# Note Well

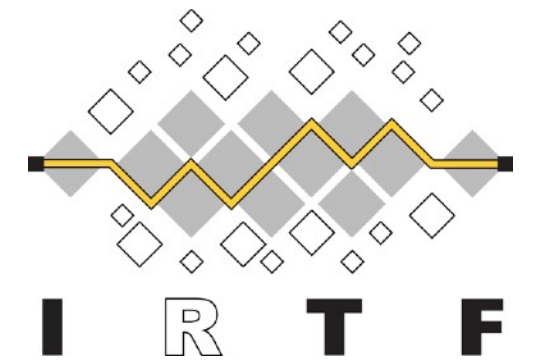
- You may be recorded
- Be nice
- The IPR guidelines of the IETF apply:  
see <http://irtf.org/ipr> for details.

# Note Well – Intellectual Property



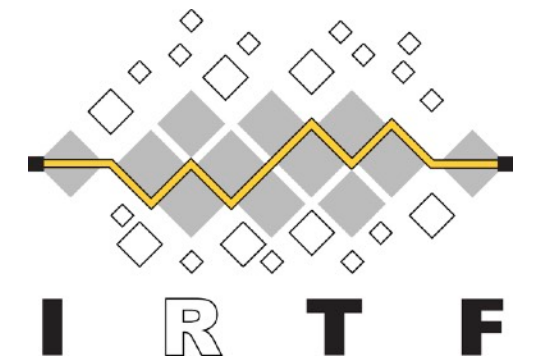
- **The IRTF follows the IETF Intellectual Property Rights (IPR) disclosure rules**
- By participating in the IRTF, you agree to follow IRTF processes and policies:
  - If you are aware that any IRTF contribution is covered by patents or patent applications that are owned or controlled by you or your sponsor, you must disclose that fact, or not participate in the discussion
  - The IRTF expects that you file such IPR disclosures in a timely manner – in a period measured in days or weeks, not months
  - The IRTF prefers that the most liberal licensing terms possible are made available for IRTF Stream documents – see [RFC 5743](#)
  - Definitive information is in [RFC 5378](#) (Copyright) and [RFC 8179](#) (Patents, Participation), substituting IRTF for IETF, and at <https://irtf.org/policies/ipr>

# Note Well – Audio and Video Recordings



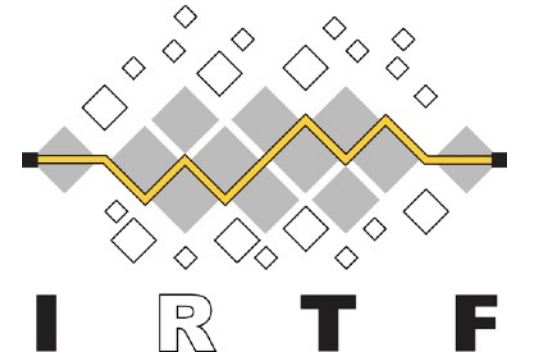
- The IRTF routinely makes recordings of online and in-person meetings, including audio, video and photographs, and publishes those recordings online
- If you participate in person and choose not to wear a red “do-not-photograph” lanyard, then you consent to appear in such recordings, and if you speak at a microphone, appear on a panel, or carry out an official duty as a member of IRTF leadership then you consent to appearing in recordings of you at that time
- If you participate online, and turn on your camera and/or microphone, then you consent to appear in such recordings

# Note Well – Privacy & Code of Conduct



- As a participant in, or attendee to, any IRTF activity you acknowledge that written, audio, video, and photographic records of meetings may be made public
- Personal information that you provide to IRTF will be handled in accordance with the Privacy Policy at <https://www.ietf.org/privacy-policy/>
- As a participant or attendee, you agree to work respectfully with other participants; please contact the ombudsteam (<https://www.ietf.org/contact/ombudsteam/>) if you have questions or concerns about this
- See [RFC 7154](#) (Code of Conduct) and [RFC 7776](#) (Anti-Harassment Procedures), which also apply to IRTF

# Goals of the IRTF



- The Internet Research Task Force (IRTF) focuses on longer term research issues related to the Internet while the parallel organisation, the IETF, focuses on shorter term issues of engineering and standards making
- **The IRTF conducts research; it is not a standards development organisation**
- While the IRTF can publish informational or experimental documents in the RFC series, its primary goal is to promote development of research collaboration and teamwork in exploring research issues related to Internet protocols, applications, architecture, and technology
- See “An IRTF Primer for IETF Participants” – [RFC 7418](#)

# Administrivia

- (Blue sheets maintained by meetecho)
- Note-takers: <https://notes.ietf.org/notes-ietf-interim-2025-t2trg-01-t2trg>
- Meetecho chat: also via Zulip: <https://zulip.ietf.org/#narrow/stream/t2trg>
- Mailing List: [t2trg@irtf.org](mailto:t2trg@irtf.org) — subscribe at:  
<https://www.irtf.org/mailman/listinfo/t2trg/>
- Repo: <https://github.com/t2trg/2025-01-data-models>

# This meeting: Data Modeling

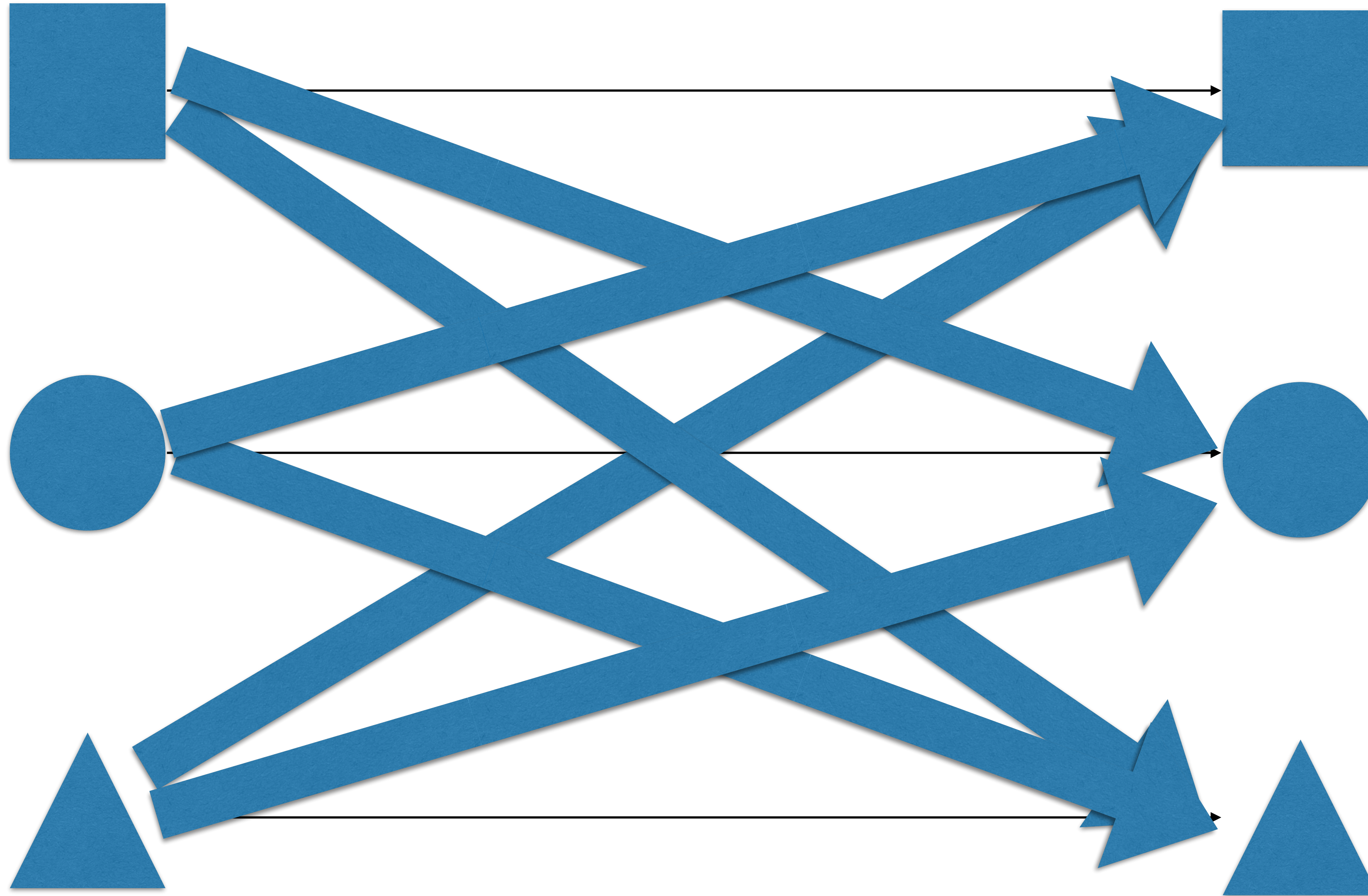
- 1000s of **classes** of IoT devices →  
Use **modeling** to aid interoperability at the application layer
- From IOTSI (2016) via WISHI (2017–) towards SDF (IETF ASDF, in 2nd last call)
  - How well does SDF stand up in applications?
  - What are the modeling requirements that SDF does not cover (yet?)?
  - What are the next steps for SDF?

Bart Brinckman      Leveraging SDF models in NIPC

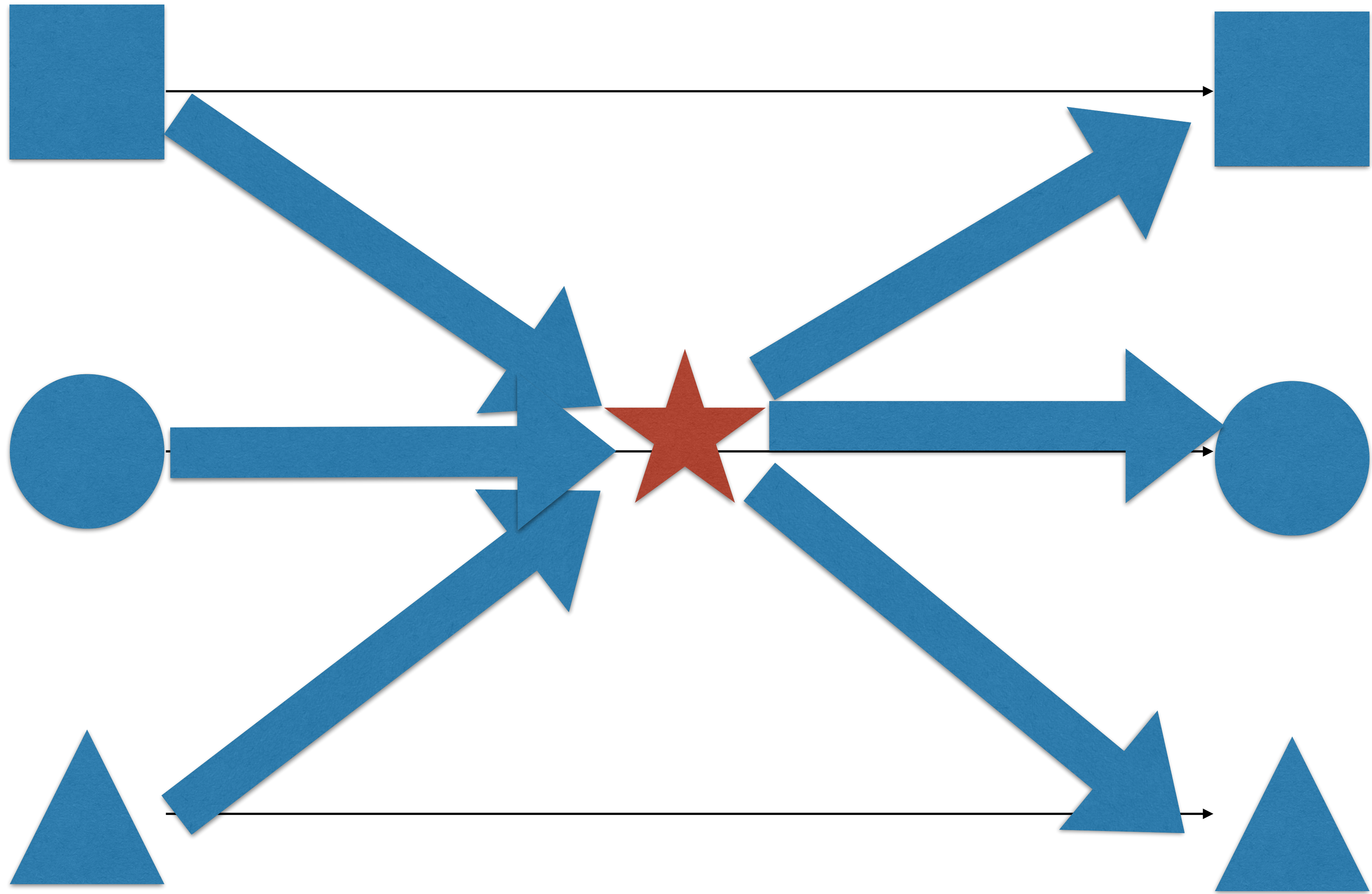
Manoj Gudi          SenML-YANG follow-up

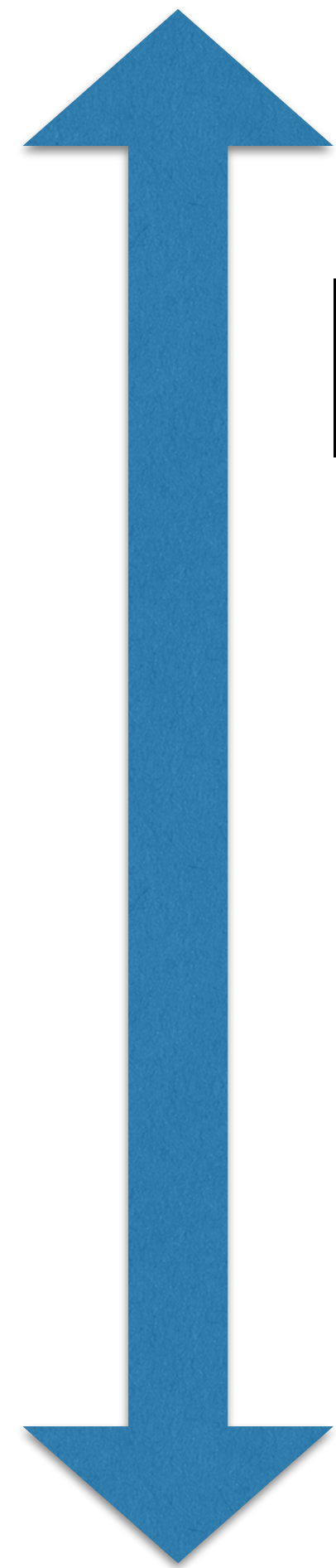
Carsten Bormann    Derivation and Instantiation: Two dimensions of model evolution

$$n^2 - n$$



$2n$





Semantic Level  
Vocabulary  
Taxonomy  
Meaning  
Ontology  
Information Model

Data Model

Abstract  
Syntax

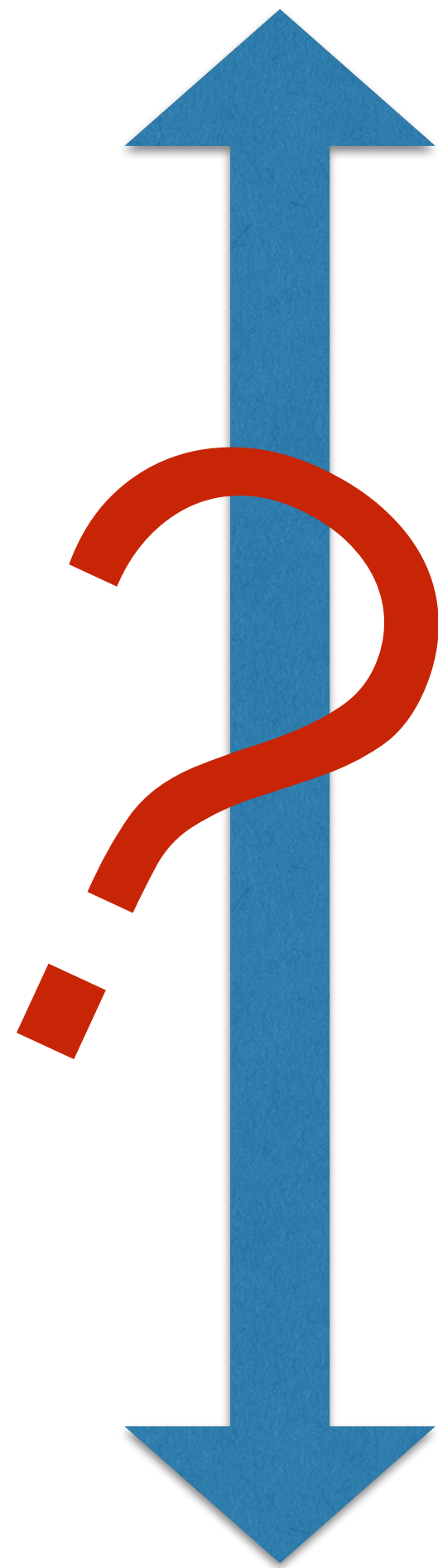
Serialization

Concrete  
Syntax

Encoding

Message  
Transport  
Format

Marshaling  
Scheme



## Semantic Interaction Model

— know what the interactions mean

## Structural Interaction Model

— know how to construct interactions

## Protocol Mapping

— can send interactions over the wire

②

Translating **data**  
between data models  
vs.  
Translating data  
**models**

# Bart Brinckman: Leveraging SDF models in NIPC

- NIPC: Provide IP access to non-IP IoT devices
  - Supporting non-IP IoT ecosystems such as BlueTooth
- NIPC gateway needs to understand these devices to some extent
- SDF fits the bill quite well
  - Need to use extension points for ecosystem-related information

# Manoj Gudi: SenML-YANG follow-up

- YANG is an interaction modeling language, a.b.n.e.u. SDF
  - YANG-CBOR is an efficient message representation format for YANG
- SenML is a **generic** data model for IoT message data (SenML Packs)
  - Has an efficient CBOR representation format
  - No modeling language defined yet for application-**specific** modeling
- Representations look surprisingly similar between SenML and YANG
- Can we benefit beyond that?

# Carsten Bormann: Derivation and Instantiation: Two dimensions of model evolution

- An SDF model describes interaction opportunities for a **class** of devices
- Devices and their models **evolve** (revisions, changing functionality)
- **Variants** of a device model are needed, without replacing base model  
**Ecosystem**-specific information needs to be added  
→ All while base model evolves, too
- Device classes are **instantiated** (based on a class, i.e., model-**controlled**),  
adding information beyond interaction opportunities (affordances),  
often **ecosystem**-specific
- **Messages** (data from/independent of interaction) need to be modeled

**Derivation**

**Instantiation**

# Upcoming meetings / activities

Online:

- **Security:** focused interim late February / early March
  - **Data Models:** More hands-on meeting mid-March to early April
- ...continue as needed

Face-to-face:

- Next **Summary** meeting probably at IETF 123 (July, Madrid)

# Agenda

Time (UTC)	Who	Subject
16:00	(chairs)	Intro
16:10	Bart Brinckman	Leveraging SDF models in NIPC
16:40	Manoj Gudi	SenML-YANG follow-up
17:00	Carsten Bormann	Derivation and Instantiation: Two dimensions of model evolution
17:20	(chairs)	Wrapup