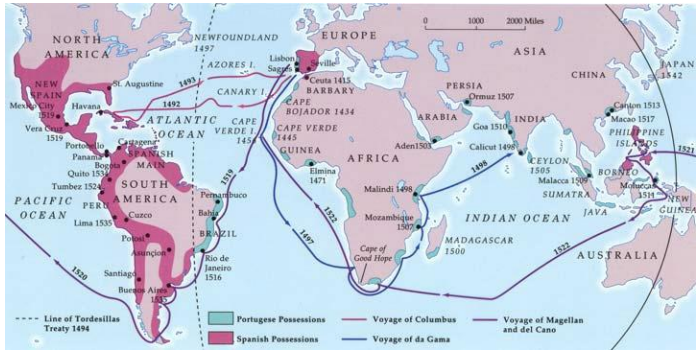
Cartography of the Tango Controls

(Status of the RFC project)

Piotr Goryl and Vincent Hardion on behalf of Tango Controls RFC Crew,
Tango Webinar, 10-06-2020, cyber-space

First start with a good map



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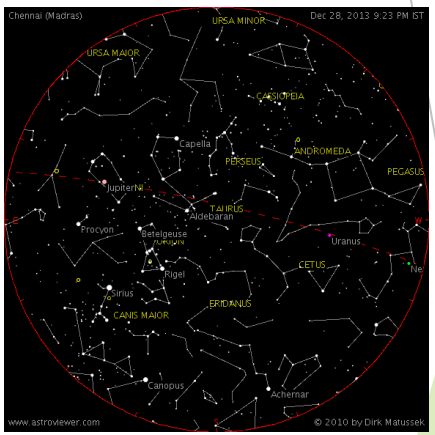

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- 21 topics proposed,
- 13 is required for development of a new Tango prototype

The cartography (goal)

- Provide a formal specification of the current (V9 LTS) Tango Controls system.
  - concepts,
  - terminology,
  - protocol behavior,
  - conventions,
- It shall be on a sufficient level for:
  - future evolution of Tango Controls
  - implementation in other languages
- Concepts are more important than implementation details.

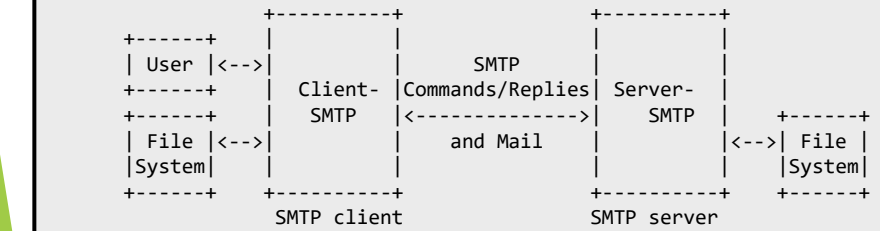
What is the RFC?

- RFC means Request For Comments
  (the first RFCs were indeed documents circulating between ARPA researchers for gathering comments)
- Example: https://tools.ietf.org/html/rfc5321

2. The SMTP Model

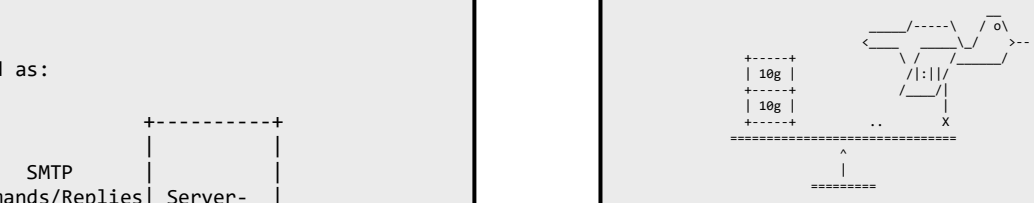
2.1. Basic Structure

The SMTP design can be pictured as:



RFC 5321 - SMTP

Weighted fair queueing (WFQ) MAY be implemented using scales, as shown:



Carriers in the queue too long may leave log entries, as shown on the scale.

RFC 2549 – IP over Avian Carriers with QoS

S2 INNOVATION

RFC and COSS

- RFC means Request For Comments
  (the first RFCs were indeed documents circulating between ARPA researchers for gathering comments)
- Consensus-Oriented Specification System
  - Facilitates collaborative specification writing,
  - Similar to source code peer-review,
  - Roles for each topic:
    - An editor – a Tango Collaboration representative
    - A contributor – anyone from the Tango Community, sending a proposal as a pull request

The Crew

- The team is volunteers from the Tango Community,
- The team meets every 2 weeks on a telco to synchronise and discuss pending work,
- S2Innovation is calling and chairing the meetings and do administration work

- Vincent Hardion (Max IV)
- David Erb (Max IV)
- Reynald Bourtembourg (ESRF)
- Andy Götz (ESRF)
- Gwenaelle Abeillé (SOLEIL)
- Sergi Blanch-Torné (ALBA)
- Sergi Rubio (ALBA)
- Lorenzo Pivetta (Elettra)
- Graziano Scalamera (Elettra)
- Olga Merkulova (IK)
- Igor Khokhriakov (IK)
- Thomas Braun (byte physics)
- Piotr Goryl (S2Innovation)
- Michal Liszcz (S2Innovation)

The ship (tools)

- Using the Consensus-Oriented Specification System (COSS),
- Work is conducted on GitHub repository: https://github.com/tango-controls/rfc
- Documents are written as .MD format, the ABNF is used for describing a communication tokens,
- A dedicated Slack channel is used for communication,
- 3 x Write the RFC (WtRFC) remote workshops

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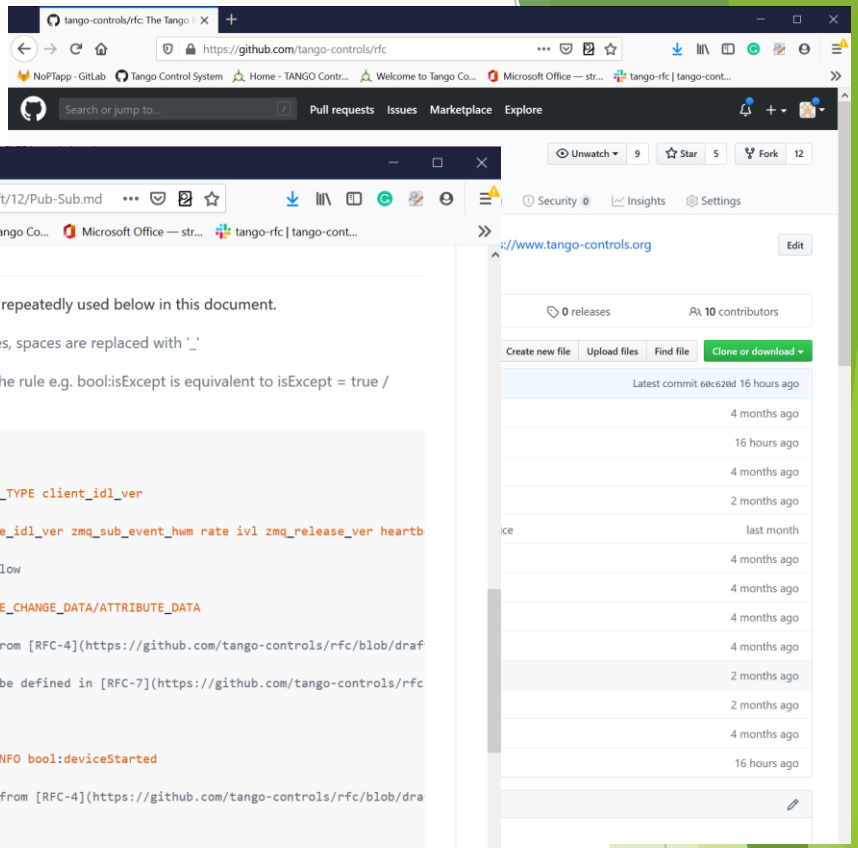
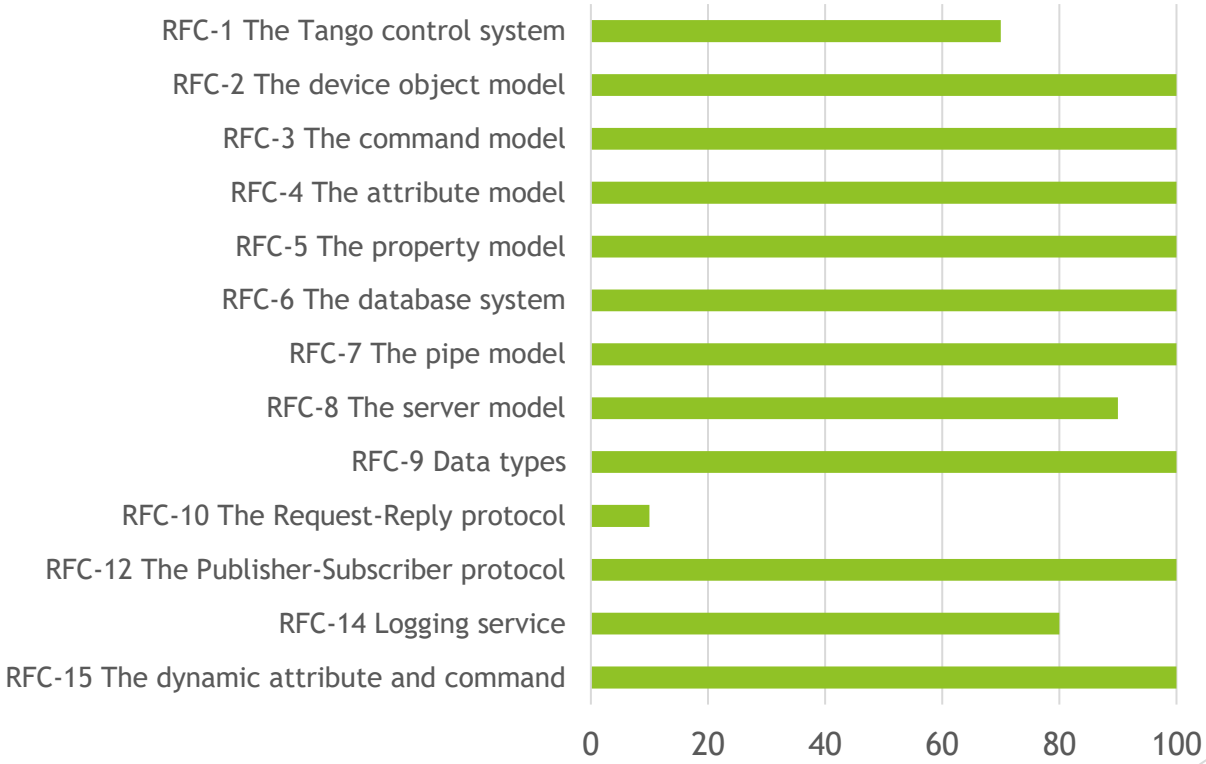


https://github.com/tango-controls/rfc

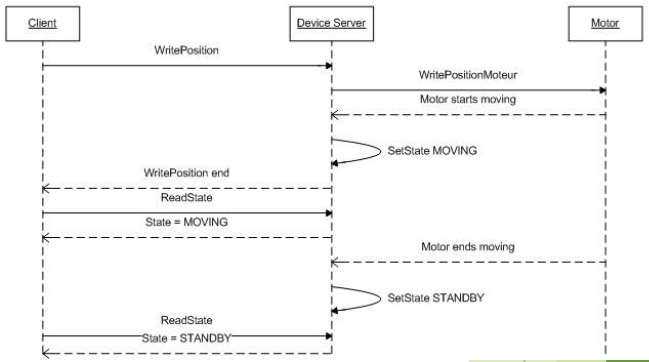
The current position(status)

(readiness for a new prototype implementation)



Tango RFC C++ prototype

- Goal is to use the RFC and change CORBA
  - Easier to read the RFC than read the code
- Work In Progress with gRPC
  - RFCs help to separate implementation details from the concept
  - Definition of RFC 10 Request-Reply in paralel
  - Keep the new Feature for later (Auth, Encryption, …)



Keeping the Tango contract between Client and Server

Testimonials

From Wilmer, computer science student @MAX IV, C++ gRPC proto

WN

Wilmer Nilsson 10:23

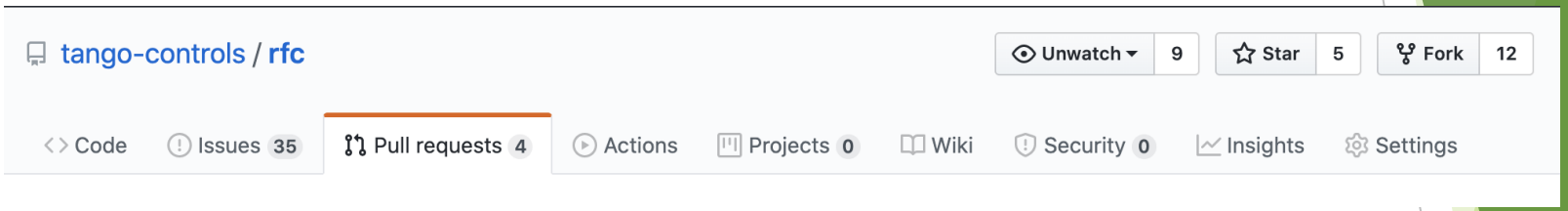
Lets take the RFC-3 on commands, for example. The Goals section gives me a good understanding of what a command __is__. Although I can't be sure that is how it is in Tango 9, it gives me a good overview of what I can remove from Tango 9 in contrast to what I should keep or refine.
https://github.com/tango-controls/rfc/blob/draft/3/Command.md

tango-controls/rfc

The Tango RFC project aims at define the Tango Controls kernel specification. - tango-controls/rfc

github.com

Byproduct when defining RFC



- Group of contributors: More people knows about the core
- Integrate new core developer
- Same vocabulary:
  - i.e Admin device, DServer, DeviceServe
- Discuss new feature, breaking compatibility, improvement on the concept level:
  - Simplify types
  - Service using the underline protocol: integration in container orchestration
  - Load balancer

Next waypoints

- Complete the core RFCs,
- Review of the specification by Tango Controls Gurus,
- Using the specification when implementing new features or bug fixing,
- Tango v9 implementation in new languages?
- A prototype implementation (heading the Tango v10)
  - Keeping Tango Controls model described in the RFCs
  - Transport protocol not-necessary compatible with Tango v9

Tango v9, v10, v11

- Tango 10:
  - New implementation of Tango 9 model,
  - New transport protocol,
  - Compatible with Tango 9 on concepts level,
  - Will need a bridge to work with Tango 9,
  - Tango 9 set of features,
- Tango 11:
  - Tango 10 extended with new features,

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Tango v10 vs. v9:

- same concepts
- new implementation

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Tango v11 vs. v10:

- Same concepts,
- New features

Thank You!

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