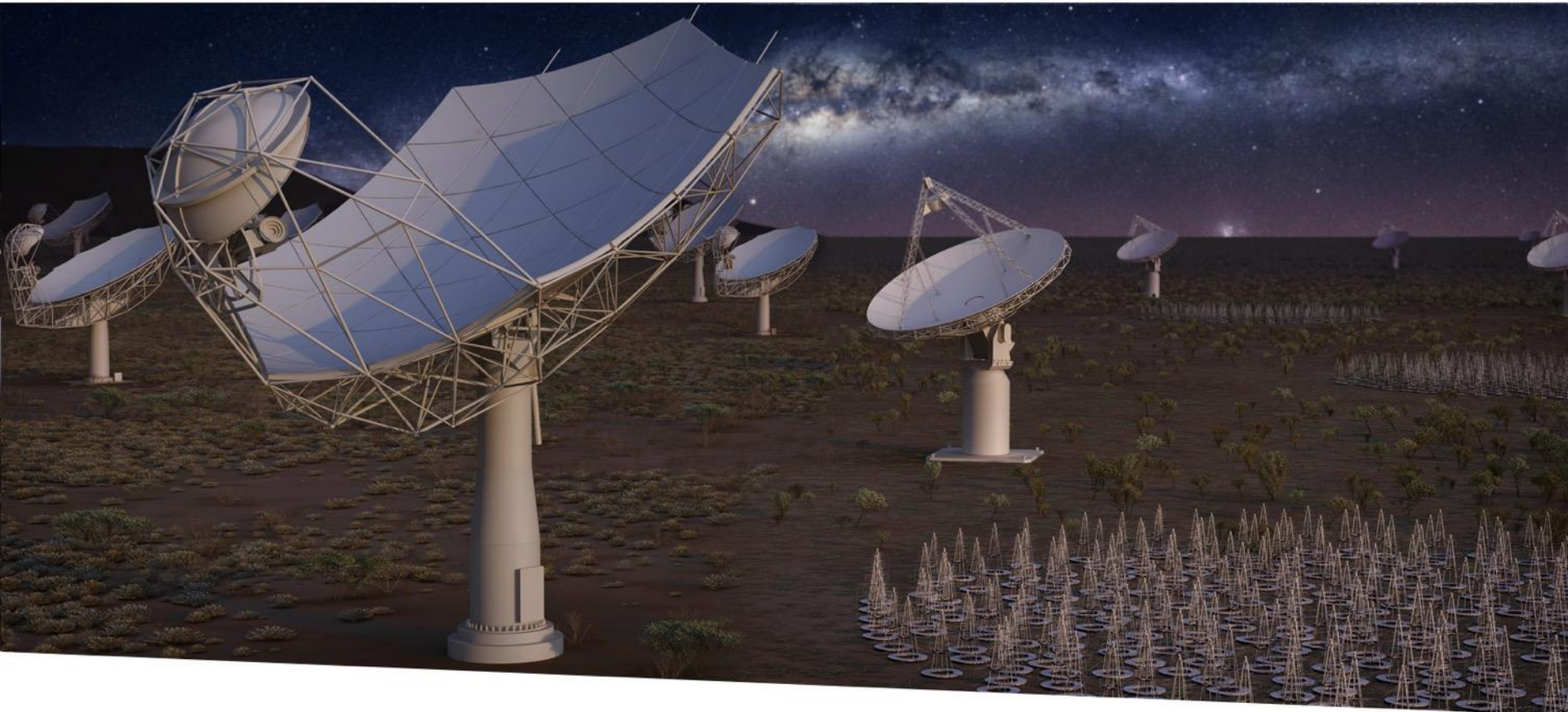# The SKA way of doing SAFe

SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

Summary

- Introduction
- Challenges in SKA software development
- What is SAFe and how it is adopted for SKA
- SAFe step by step in SKA bridging
- Towards Construction

SKA: a global Research Infrastructure

Potential Future Members

Members
Host Countries: Australia, South Africa, United Kingdom

African partner countries

Challenges in SKA software

SKA will likely be a software dominated Observatory

- Highly automated monitors and controls
- Highly automated observation campaigns
- Flexible to adapt to science needs
- High degree of international coordination/cooperation

"What if we found ourselves building something that nobody wanted? In that case, what did it matter if we did it on time and on budget?" Ries, Eric. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses. The Crown Publishing Group.

We need a suitable approach:

SAFe is a globally recognized standard

The SKA direction

- Less worried about the distinctions; overall the **project/organisation** is adopting a lean/agile approach
  - Lean
  - Agile

  SAFe is a best practice, but we are adapting to the specific needs of the project and tailoring as appropriate to the circumstances (agile by definition!)

  So the distinction between a SAFe work package or not should not be a significant difference in how we manage or perform the work

Organisationally working through the details but as software permeates all facets of the observatory delivery, they will align, i.e.,
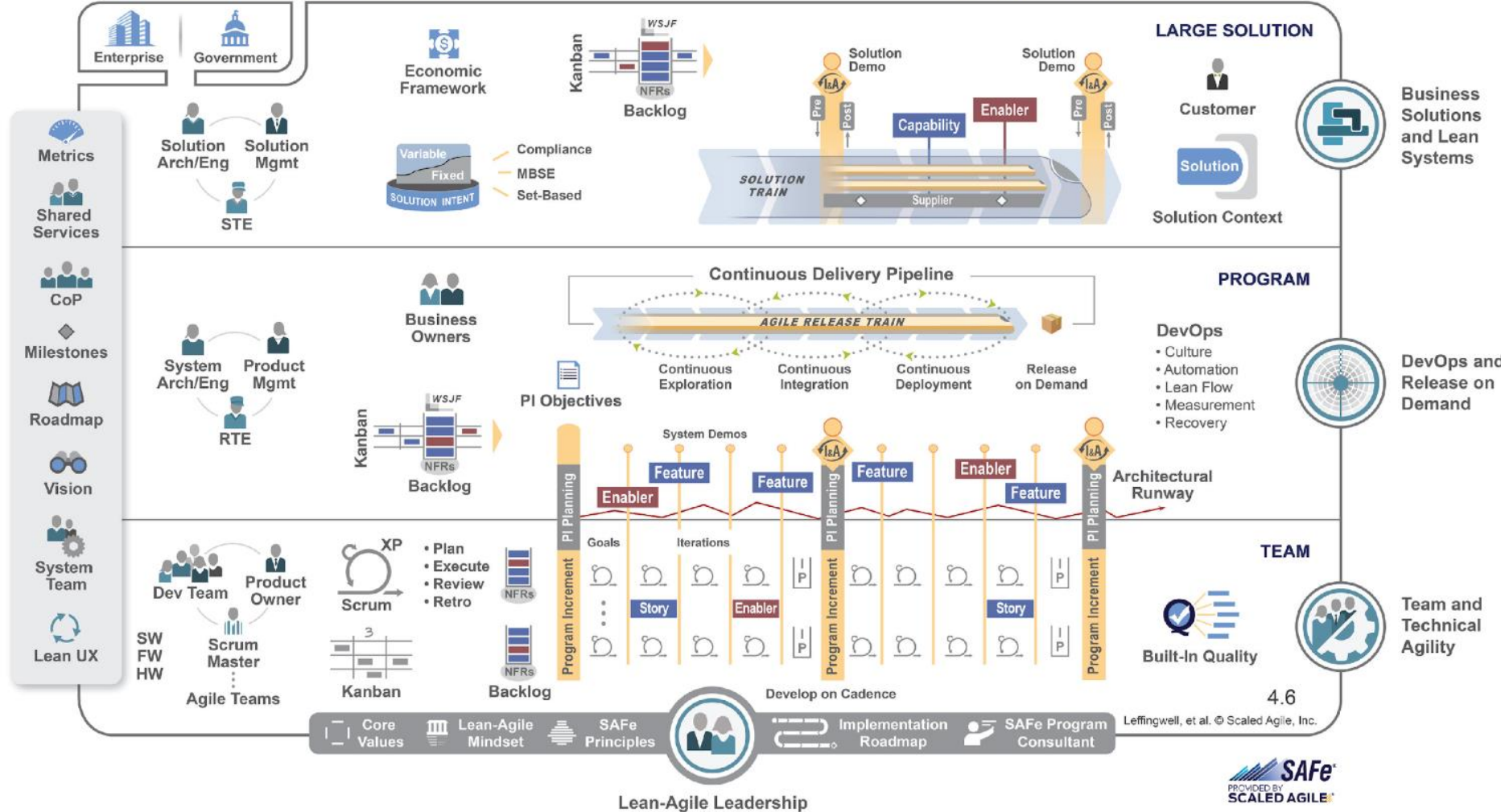
- Agile teams will be delivering to product delivery teams and ultimately to the telescope delivery teams (customer)
- Delivery teams are integrated into the PI process and will be aligned with the planned project cadence of 3 months
- SAFe Solution level integrated into Telescope and Observatory delivery

What is SAFe®?

What is SAFe®?

How is SAFe® different from classical product development:

- The product is not completely defined, but adapted to the needs of the stakeholders, that **may be tweaked during the project**
- Active stakeholder engagement is key. This can be seen as a **risk mitigation cost** to help the the stakeholders and the teams implement the final product as it needs to be.
- **Empowerment of the teams** to deviate from the original idea to implement what is right and better.
- What matters is the **efficient use of resources** by continuous improvement to achieve the best possible result. Good enough is not enough!
- SAFe it is not a silver bullet. It is expensive to implement, but statistically delivers better results.

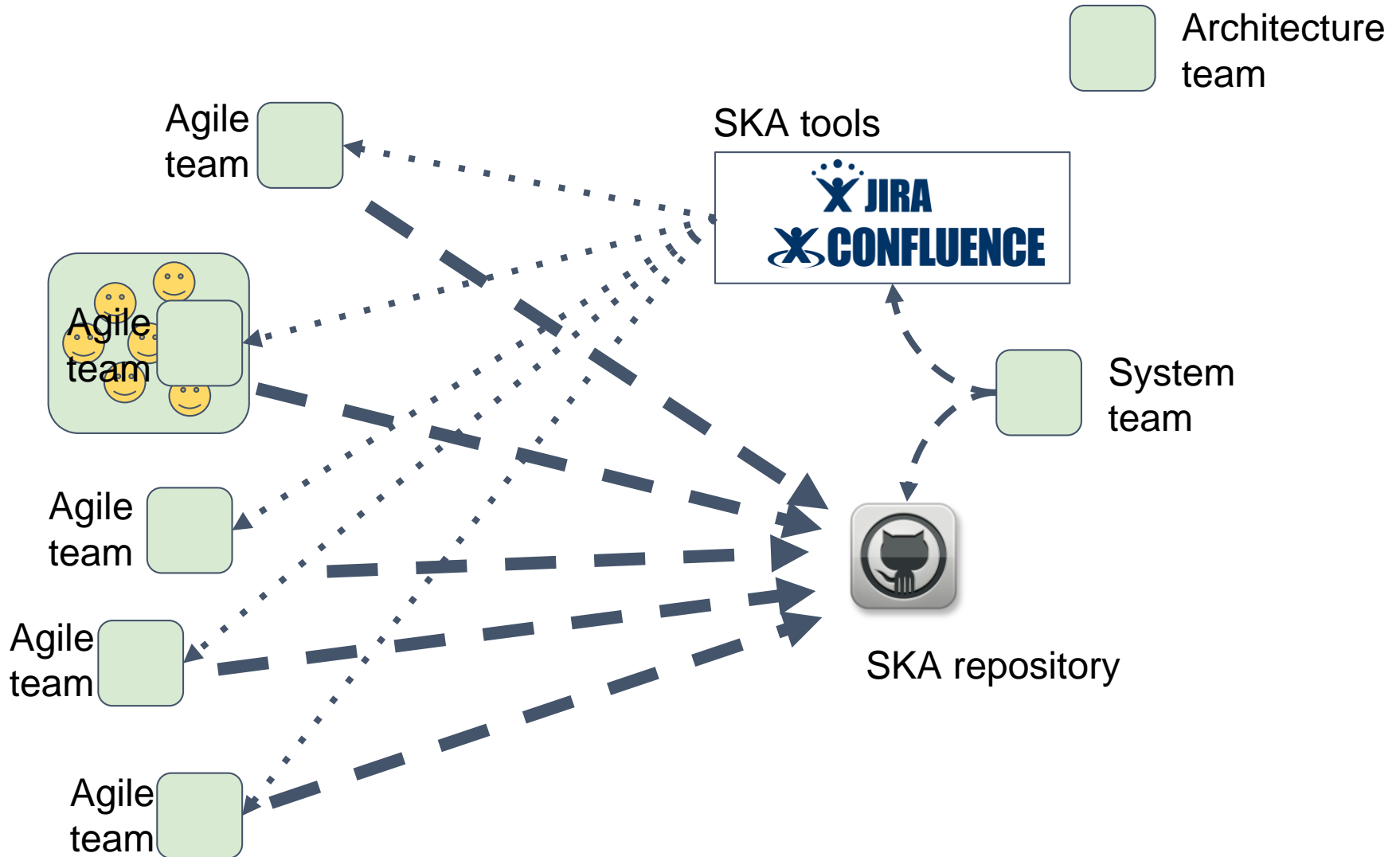# How does SKA differ?

… but SKA is not a normal company…

- SKA is not vertically integrated and deals with **distributed resources** across the globe
- SKA is **not "just" software development**, but software is one (fundamental) part of a bigger scope
- SKA software is aimed to provide tools to push the boundaries of science and this requires rare competencies that **cannot be exchanged** between teams
- SKA is formed by many different partners, following different rules, that **use public money** to fund this endeavor.
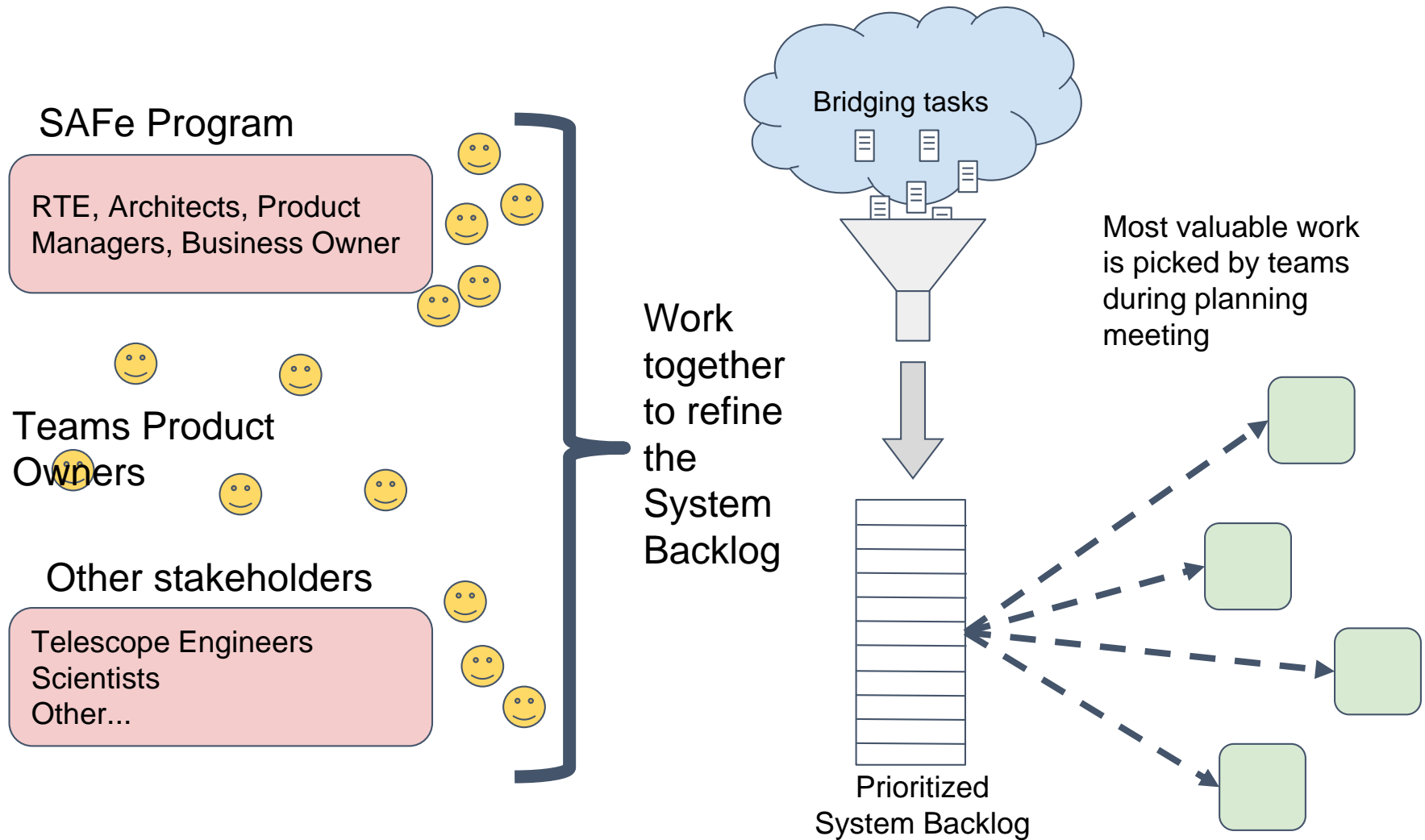
SAFe® bridging vision
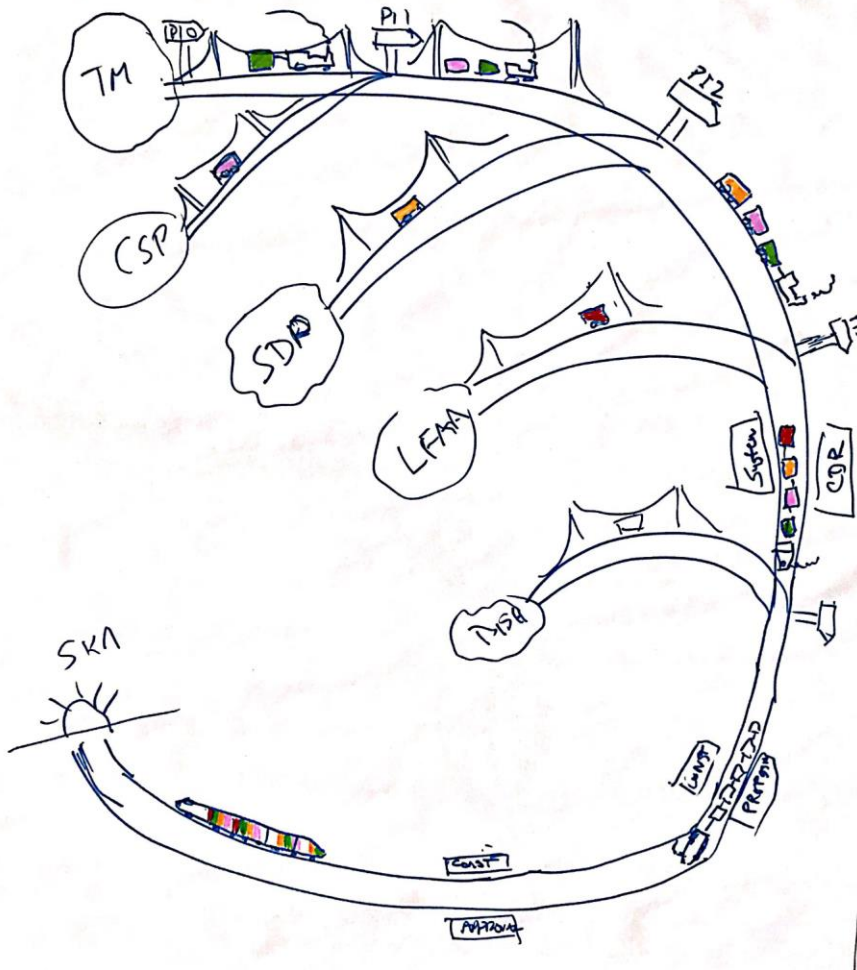
- Transition from consortia "islands" to single development "train"

- Program Increment (PI) Planning meetings are mileposts on the way. Major milestones are "stations".

- All SAFe work in bridging converges under a single SOW

- See also: https://docs.google.com/document/d/1QiSQfh0YiwaCc7A16qQjKj7BuXfBLsMzrrz4eMn3YvY/edit

SAFe® step by step in SKA bridging

Architecture team

Agile team

SKA tools

JIRA
CONFLUENCE

Agile team

Agile team

System team

Agile team

SKA repository

Agile team

SAFe® step by step in SKA bridging

SAFe Program

RTE, Architects, Product Managers, Business Owner

Teams Product Owners

Other stakeholders

Telescope Engineers
Scientists
Other...

Work together to refine the System Backlog

Bridging tasks

Most valuable work is picked by teams during planning meeting

Prioritized System Backlog

How much work has been done?

- Now:
    - 5 (or 6 or 7) teams formed
    - ==192== stories concluded since first start
    - ==545== story points of work
    - ==390== commits

==<Add photos of the last PI Planning meeting>==

PI#1 Planning meeting

Towards Construction

SAFe is partially implemented, ramping up to Construction (in chronological order):

- **Cost and progress monitoring** will be extracted from SAFe and matched to the rest of the project (e.g. Earned Value Management)
- The **software development WBS** is being built to allow for the necessary small scope adjustment. Larger changes are still subject to change management process.
- **Telescope Delivery Team** structure will harmonize with SAFe
- **Contract structure** will be finalized to satisfy organizational and funding constraints, starting from the lessons learned from MOUs as a simplified NEC4 contract

Towards Construction

SAFe is a framework that allows for tailoring

- 3 Months cadences of PI
- Onboarding process - on demand
- Adjusting the planning meetings to the time zones (how to do with NZ?)
- Looking into flexible ways to include non-SW activities
- Feature planning meetings engaging all the teams
- Generate two "Solutions" (MID and LOW telescopes) using shared ARTs

Questions?

Support material

SAFe Implementation Roadmap
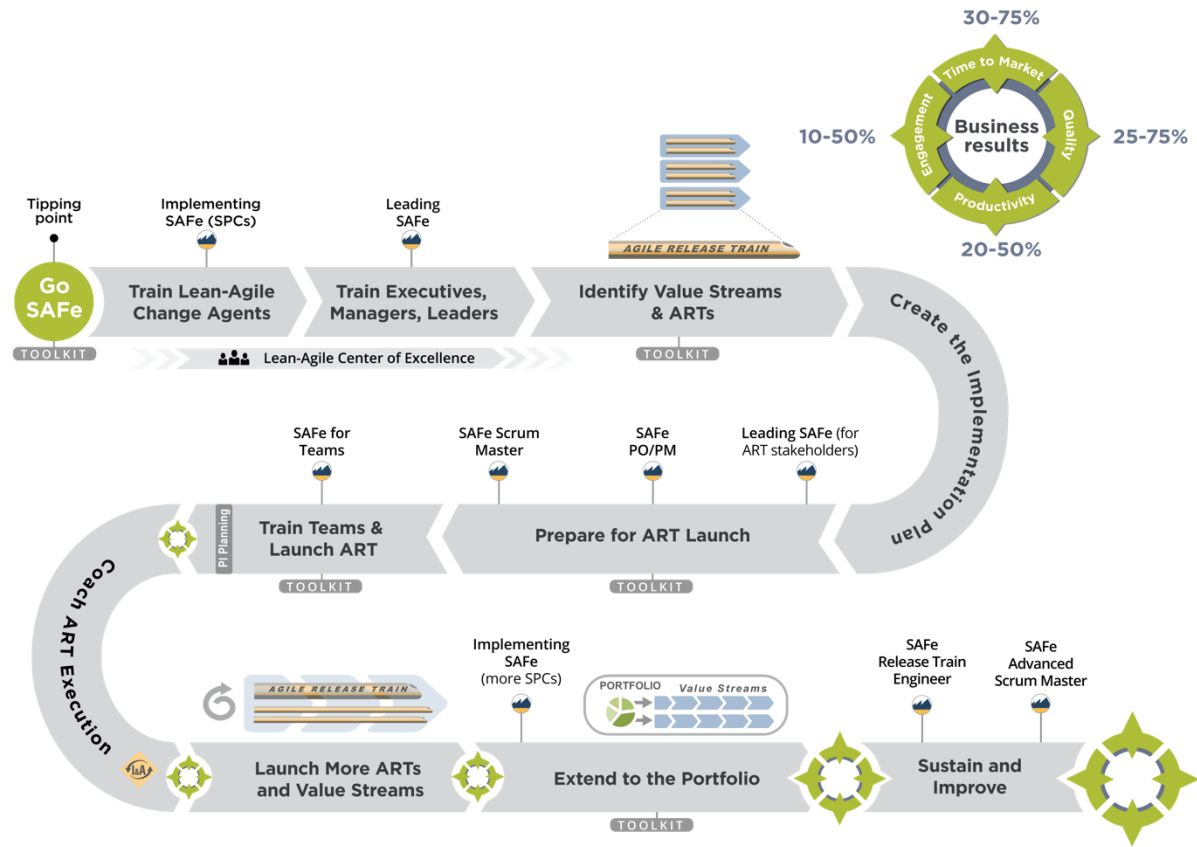
© 2008–2017 Scaled Agile, Inc.

The SKA way of doing SAFe®

Many communication channels:

- All-hands Program Increment planning meetings every 3 months
- Weekly "Scrum of Scrums" to identify process bottlenecks and improvements.
- Weekly "PO Sync" meetings to identify content issues.
- Information distributed within teams at daily 15 minute stand-up meetings.
- Teams plan and review on 2 week cycle.
- Confluence and Jira areas are open to everyone.
- Global slack channels for announcements and messages.
- All teams also have a dedicated Slack channel.
- Other ad-hoc meetings when required

The SKA way of doing SAFe®

To account for the assumptions and limitations described we can propose 2 possible onboarding ways:

- Set up an Agile team, in agreement with the SKA guidelines:
  - Define 1 Scrum Master and 1 Product Owner per team
  - The SM and PO participate to the weekly SKA coordination teleconferences
  - Team members can belong only to one team and commit >50% of their time to the team work
  - The team is co-located as much as reasonable and this does not jeopardize the teamwork
  - The team uses the Confluence and Jira tools provided by the Office to coordinate its work
  - The team starts defining its own tasks (stories) and commit to participate to the next PI planning meeting where the plan for work in the next 13 weeks is agreed in accordance with the SAFe practices.
- Join an existing team
  - Start by helping with the ongoing team activities
  - Participate together with the team to the next PI planning meeting where the plan for work in the next 13 weeks is agreed in accordance with the SAFe practices.

More at:
https://confluence.skatelescope.org/display/SE/Bridging+organisation

SAFe tools – launch at PI1

Developer Portal

Jira progress reports

GitHub repository and workflows

GitLab Continuous Integration

Program Increment meetings

- SAFe revolves around a major cycle cadence of 8-13 weeks.

- We have chosen to run with 13 weeks initially.

- Planning ideally in "all-hands" face to face meetings

- Our Program Increment planning meetings are scheduled on PI boundaries:
  - PI1: Week Commencing the 3rd December 2018
  - PI2: Week Commencing the 25th February 2019
  - PI3: Week Commencing the 3rd June 2019
  - PI4: Week Commencing the 2nd September 2019
  - PI5: Week Commencing the 25th November 2019

- During construction the whole project will work to the same cadence.
  - For more information see: https://confluence.skatelescope.org/display/SE/Program+Increments+%28PIs%29+and+cadence

Work Management

- Overall Program Backlog kept in SP project in SAFe.
  - https://jira.skatelescope.org/projects/SP
  - Initial content derived from CDR actions and SOW confluence pages, but diverges after that.
- Product Management (PM's and PO's) analyze, refine and prioritize this backlog into features and enablers.
- Teams pull from this high priority features and enablers at Program Increment planning meetings
- Teams break the features and enablers into stories that they track in their own Jira projects.
- All teams have an area in confluence for their meetings and discussions.

Who is involved?

- Ex-TM consortia

- Ex SaDT consortia

- Just starting with Networks and LMC of SaDT consortia

- In discussions with CSP consortia
  - PSS, PST, LMC, LOW.CBF and MID.CBF are all different.

- Will work with LFAA and SDP consortia after close out.

- There have been some discussions about on-boarding DISH.LMC early.

Who is involved?

- Product management:
  - Robert Laing, myself, team PO's
    - Additional positions in business plan
  - Feature backlog (~SOW tasks) is in Jira:
    - https://jira.skatelescope.org/projects/SP/summary
- Architecture
  - Marco Caiazzo (PO), supported by architecture team.
    - Including Lorenzo, with additional positions in business plan.
- Release Train Engineer
  - Marco Bartolini (interim), but position vacant.
- Others in software team are product owners and scrum masters of individual teams.

Team resources

- SAFe Architecture Team:
  - Confluence: https://confluence.skatelescope.org/display/SE/Architecture+Team+-+SARCH
  - Jira: https://jira.skatelescope.org/projects/SARCH

- NCRA Team:
  - Confluence: https://confluence.skatelescope.org/display/SE/NCRA+Team+-+AT1
  - Jira: https://jira.skatelescope.org/projects/AT1

- OSO-UI Team:
  - Confluence: https://confluence.skatelescope.org/display/SE/OSO-UI+Team
  - Jira: https://jira.skatelescope.org/projects/AT2

- SAFe System Team:
  - Confluence: https://confluence.skatelescope.org/display/SE/System+Team+-+ST
  - Jira: https://jira.skatelescope.org/projects/ST

SKA SAFe Bridging Information

https://confluence.skatelescope.org/display/SE/Bridging+organisation