Wow!
Configuration management across teams and tools with IBM Rational Jazz

DCM-1877

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IBM.

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Please note

This presentation discusses
vision and product capabilities
in beta at jazz.net

Agenda

- What challenges are we addressing?
- How have they been (half-way) solved in the past?
- Use cases – relatively simple & relatively complex
- A new approach to solving these challenges
- Looking over the horizon and speculating
- Where to see and learn more

What problem are we solving?

- Today's complex products and systems are mix of software, electronics, and hardware – with software taking an increasing role

What problem are we solving?

1. Today's complex products and systems are mix of software, electronics, and hardware – with software's role increasing.

2. The design and development of these complex systems requires many kinds of artifacts. Engineers in specialist disciplines produce these artifacts.

3. Engineers practicing the various engineering disciplines use various tools. They come from multiple vendors.

4. But these artifacts typically are not under Configuration Management, or if they are, it's done with half-measures that incur trade-offs.

5. These challenges exist for software-only systems, yet their magnitude is much greater for products with physical, electrical and software aspects.
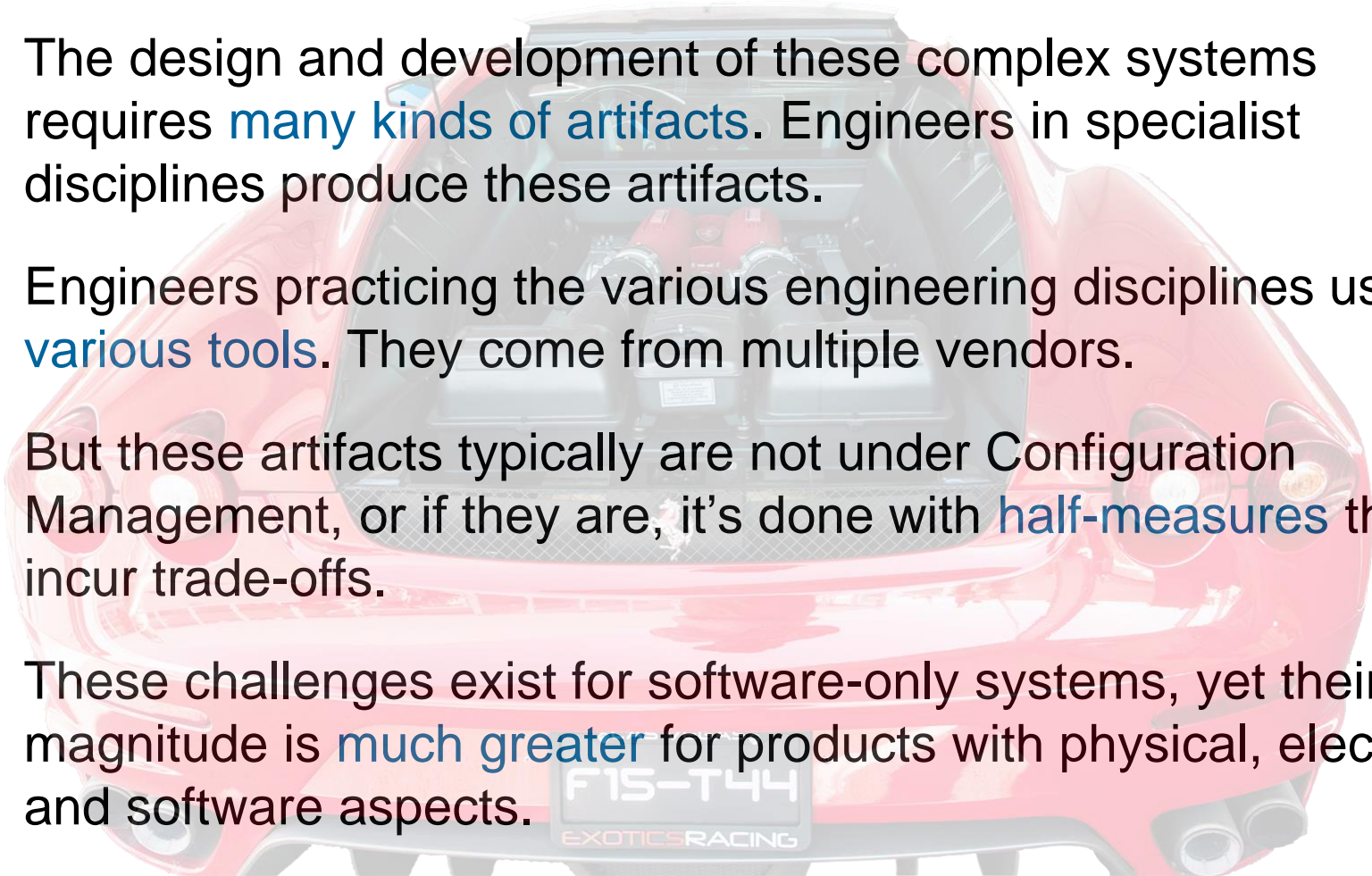
Half-way solutions (1) Simple file-based approach

Your choice of tools
Use files or export to files

User managed,
File-based,
**Software Configuration**
Management

Problems:

- **Granularity** of export and import
- **Poor Audit Trail**
    - Your files in SCM are not in sync with the artifacts in the tools
    - Loss of artifact versioning, history, and audit trail
    - Difficult to enforce, or even monitor, adherence to policies
    - Queries and reports on past baselines require reconstructing tool data

Half-way solutions (2) Single repository approach

Vendor lifecycle tools

Additional
tool needed
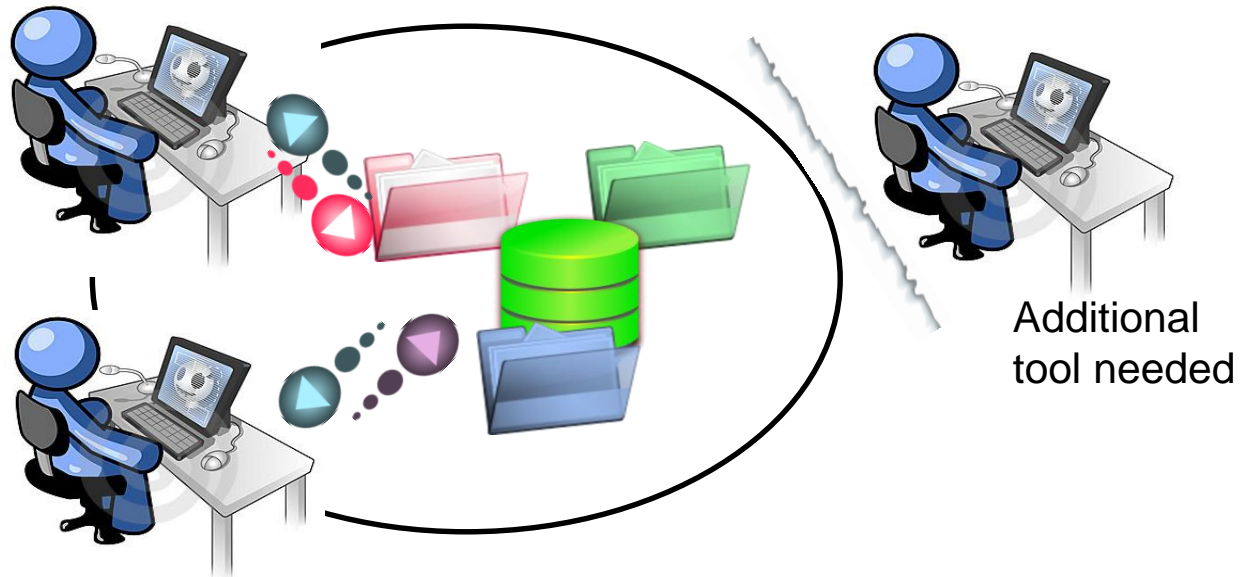
Problem:

- Not practical: tools come from many vendors
- Can't use best-of-breed tools across HW & SW configuration management
- Life happens: mergers, acquisitions, re-organizations

So what is better?

Tools build on open, flexible services and Internet architecture with cross-tool configuration management

Requirements Author

Test Developer

Third party tool

Configuration Lead
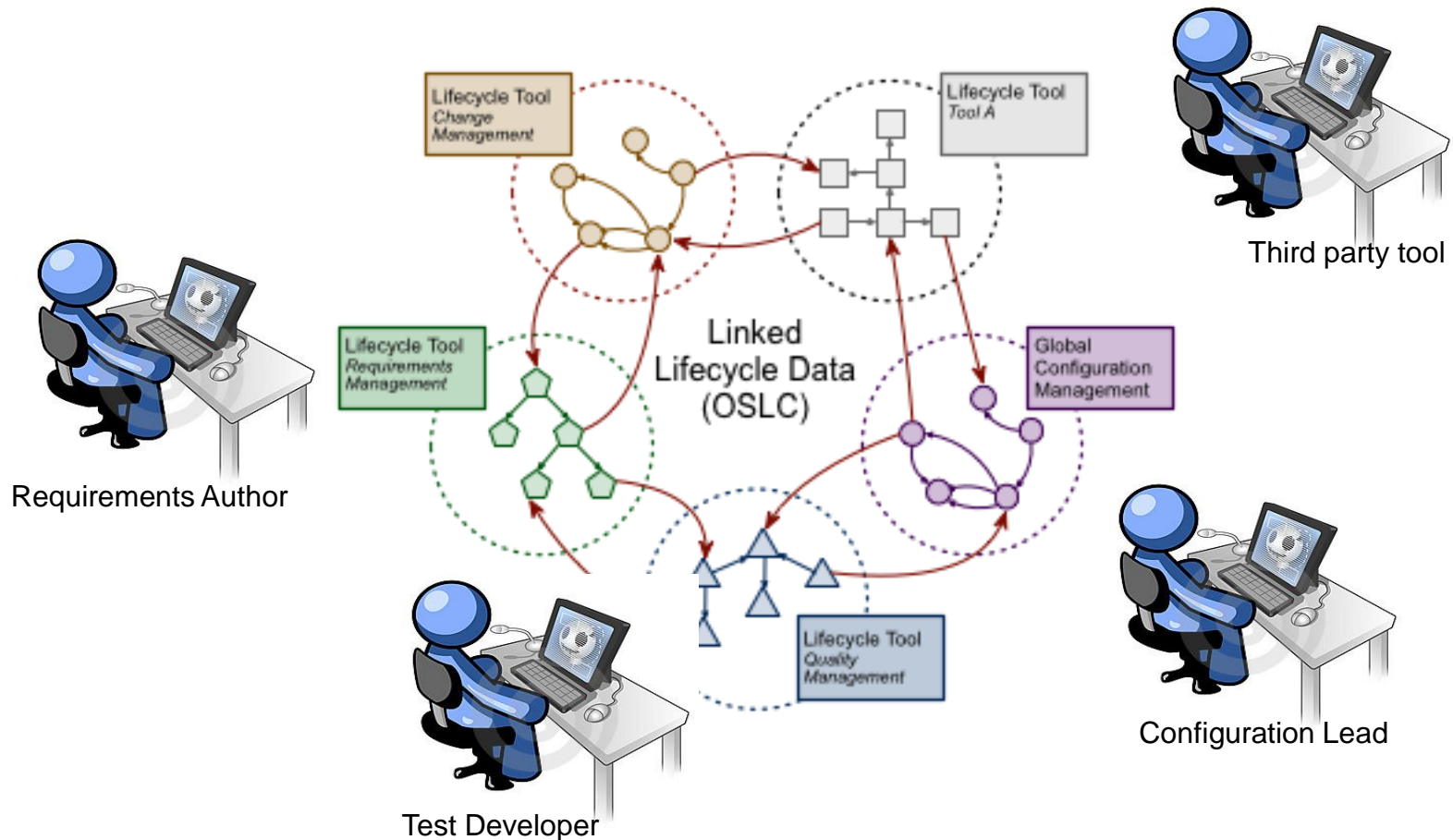
Use cases in pictures

From simple to complex

- Streams and baselines across tools
- Some parallel development scenarios
- Some reuse scenarios

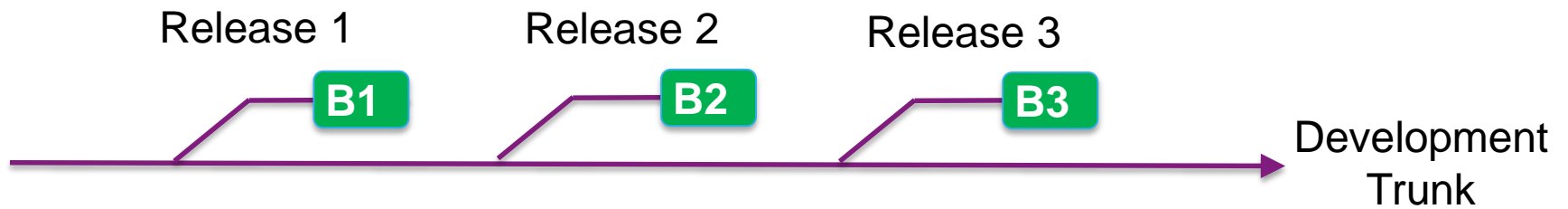# Baselines and streams

Tests and code …
Requirements and tests …

B1 —— B2 —— B3 → Development Trunk

Stabilization streams

Tests and code …
Requirements and tests …

Release 1   Release 2   Release 3

B1   **B2**   **B3**

Development Trunk

Branching and delivering – using side streams
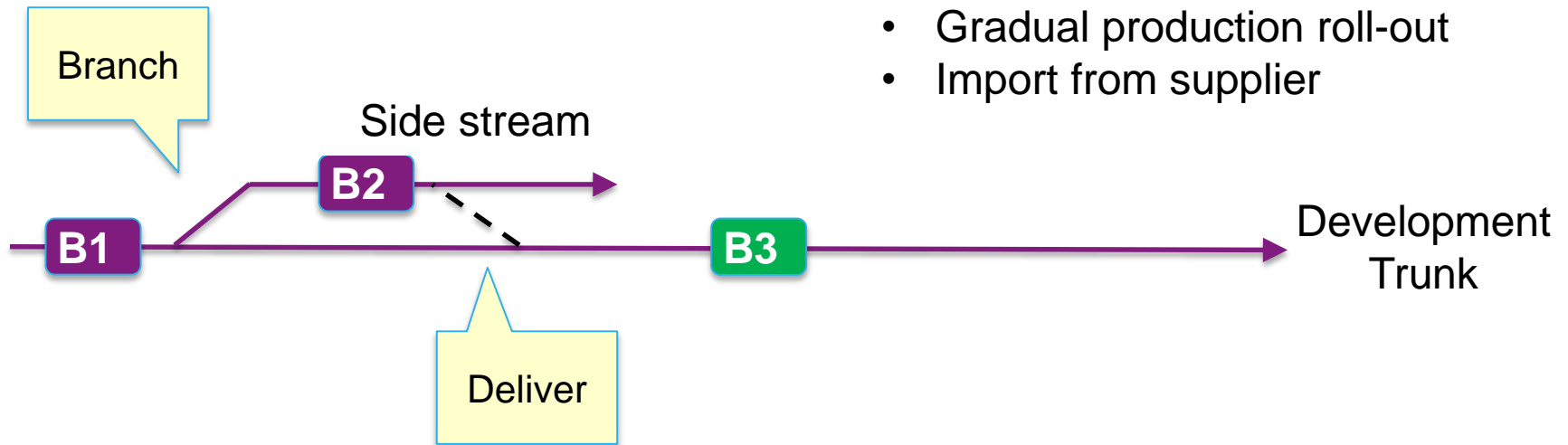
Tests and code …
Requirements and tests …

Some reasons for side stream
- Spike experiment
- A/B Test
- Gradual production roll-out
- Import from supplier

Branch

Side stream

B2

B1

B3

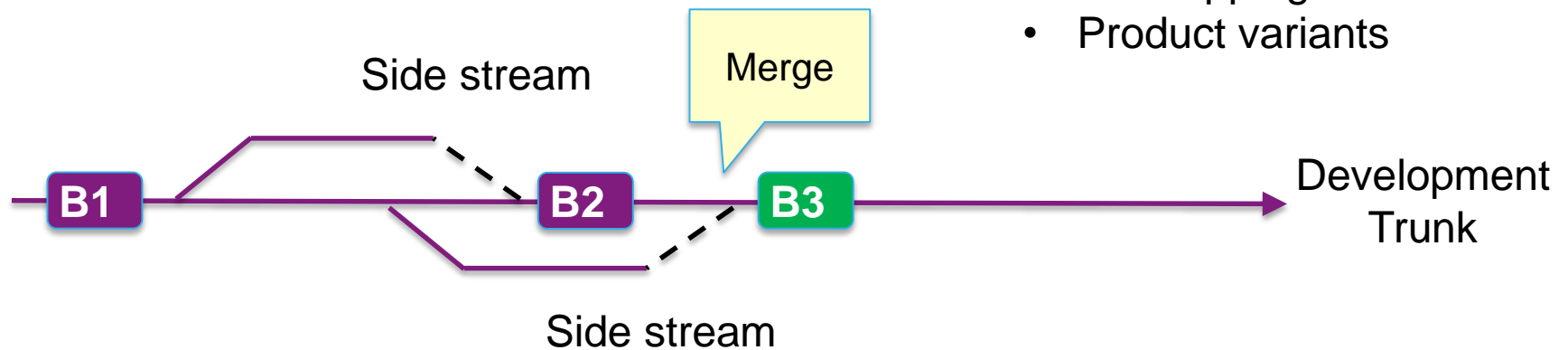Development
Trunk

Deliver

Parallel development and merging

Tests and code …
Requirements and tests …

Some reasons for parallel development
- Shared artifacts
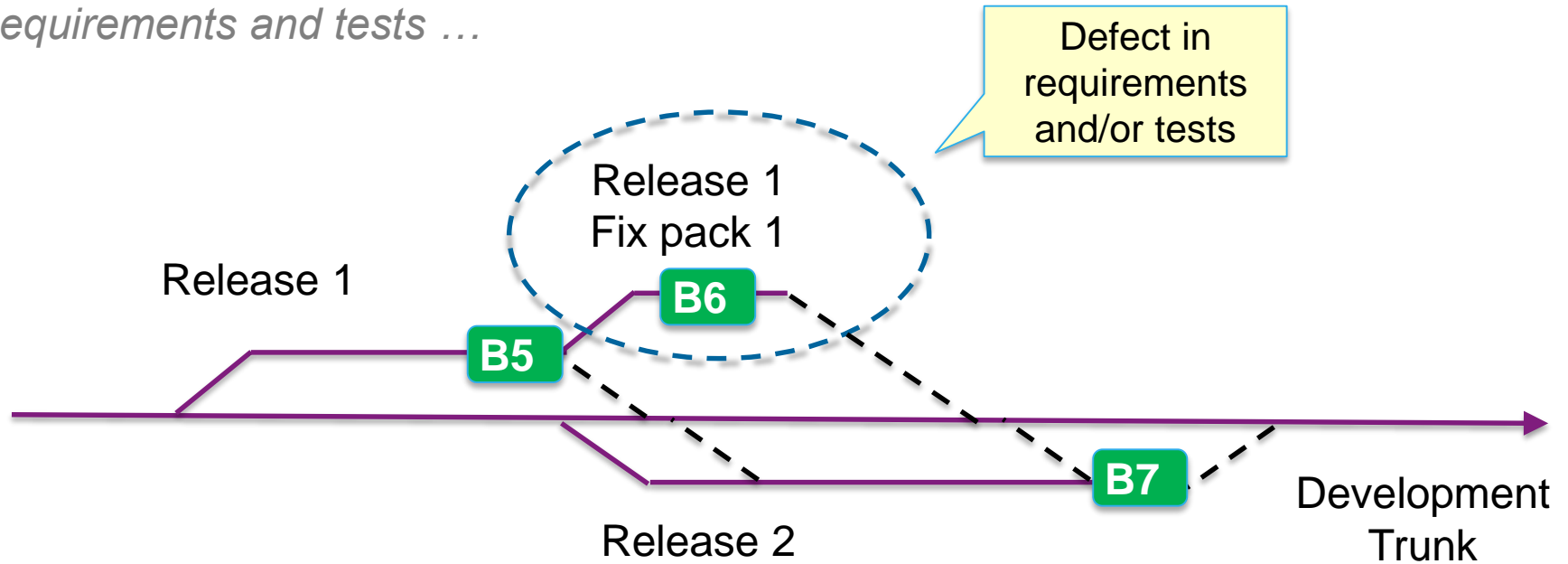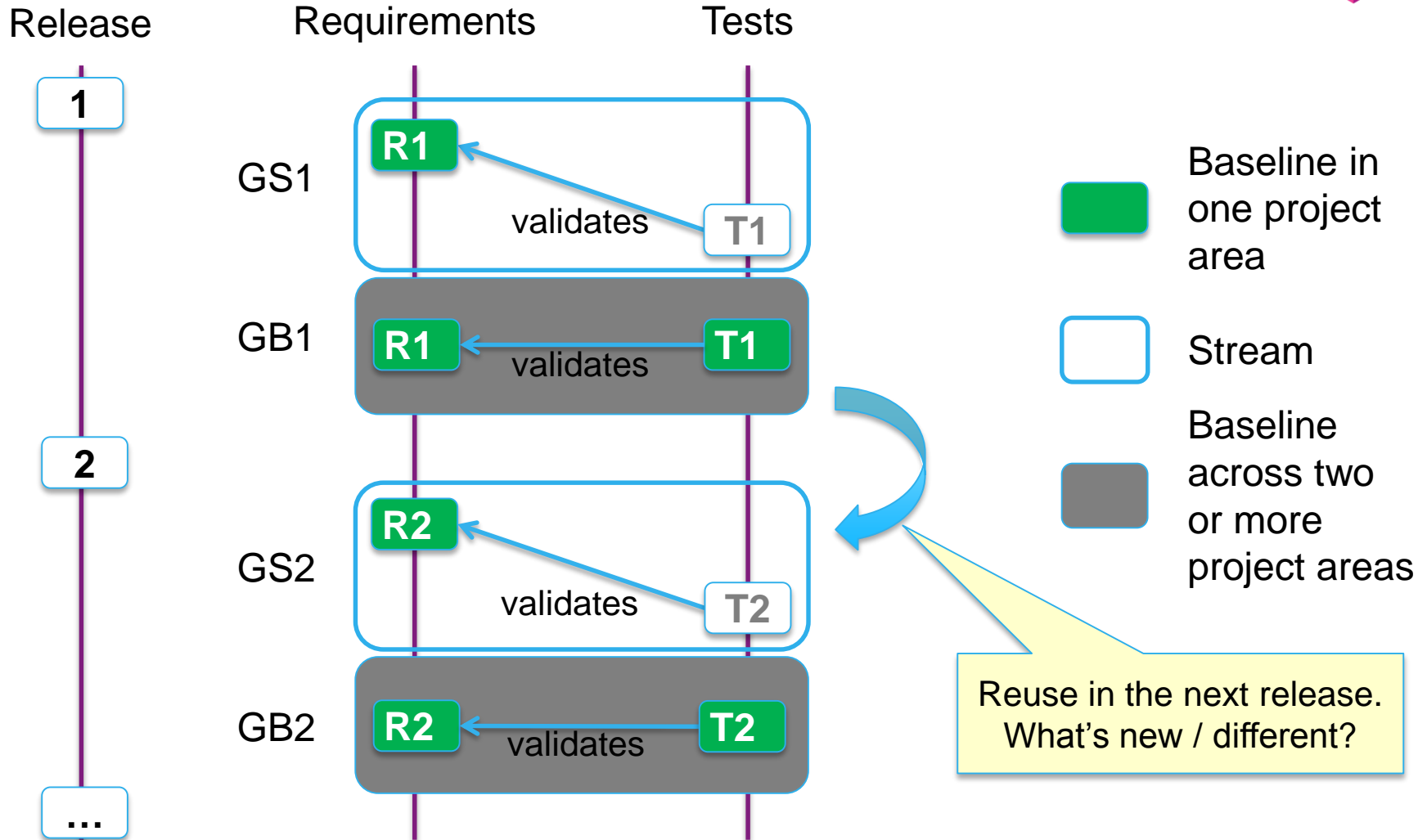- Overlapping releases
- Product variants

Side stream
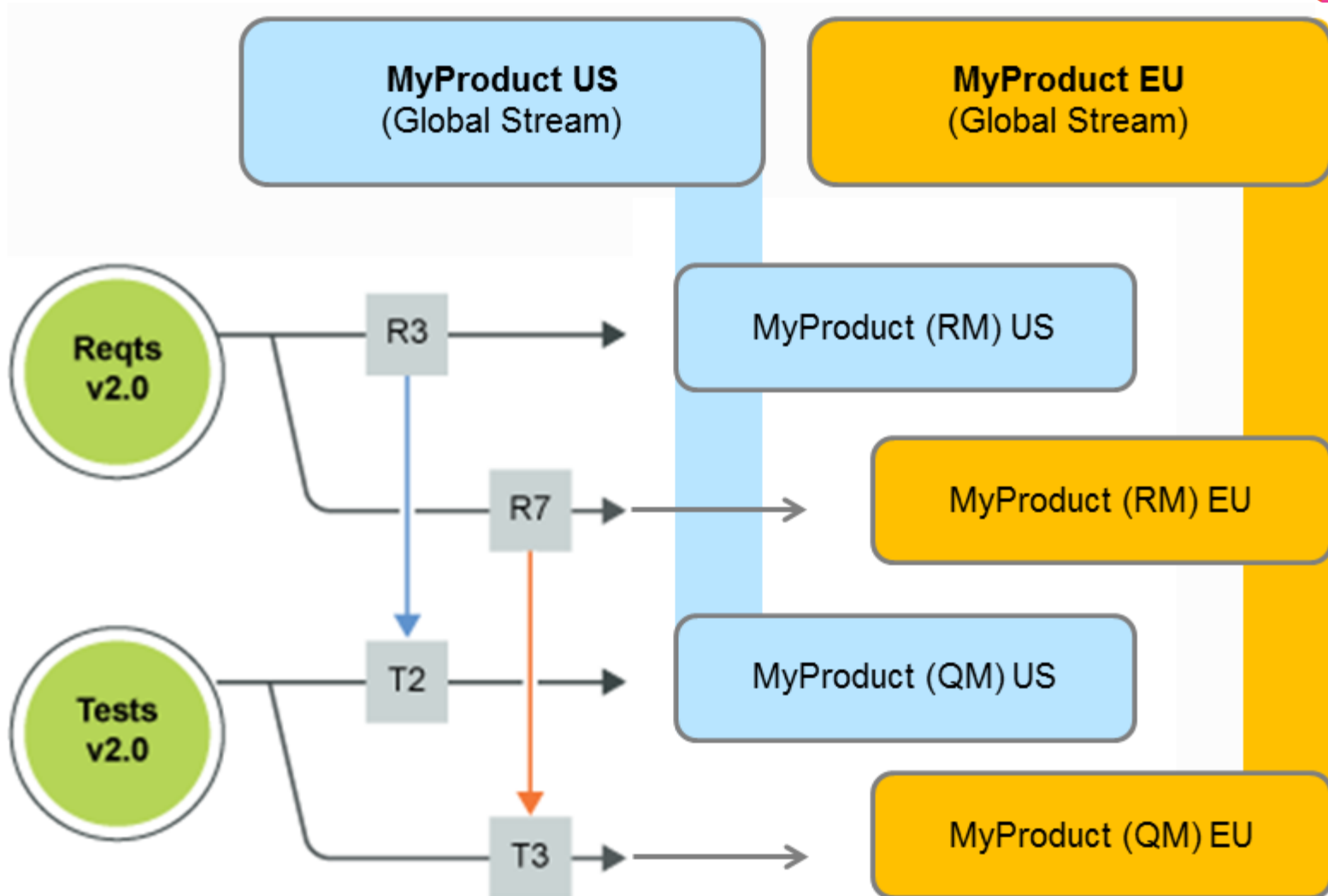
Merge

B1   B2   B3

Development Trunk

Side stream

Fix pack

Tests and code …
Requirements and tests …

Defect in requirements and/or tests

Release 1
Fix pack 1

B6

Release 1

B5

Release 2

B7

Development Trunk

Configuration management across the lifecycle

Release

1

2

...

Requirements

Tests

GS1
R1
validates
T1

GB1
R1
validates
T1

GS2
R2
validates
T2

GB2
R2
validates
T2

Baseline in one project area

Stream

Baseline across two or more project areas

Reuse in the next release. What's new / different?

Global streams, isolated changes and linking

Enterprise program with common requirements
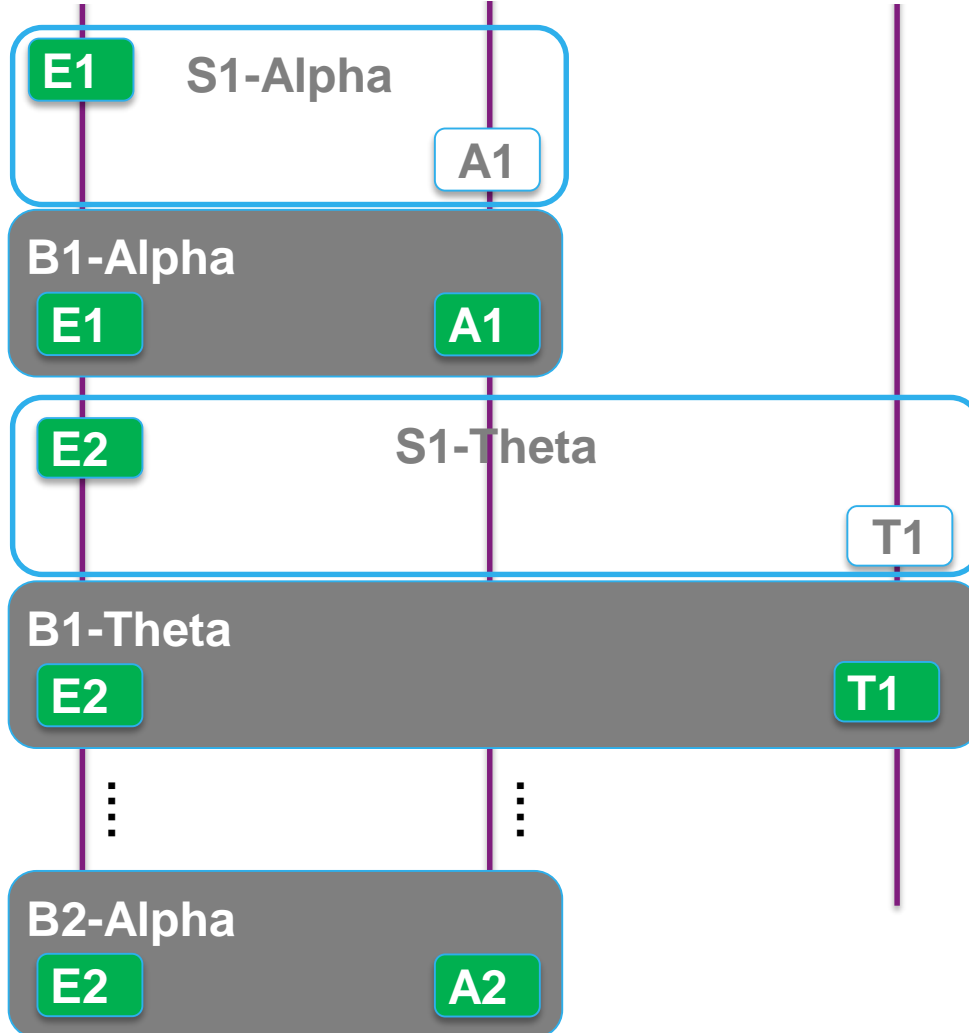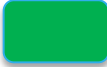
Analyst & Designer work one sprint ahead
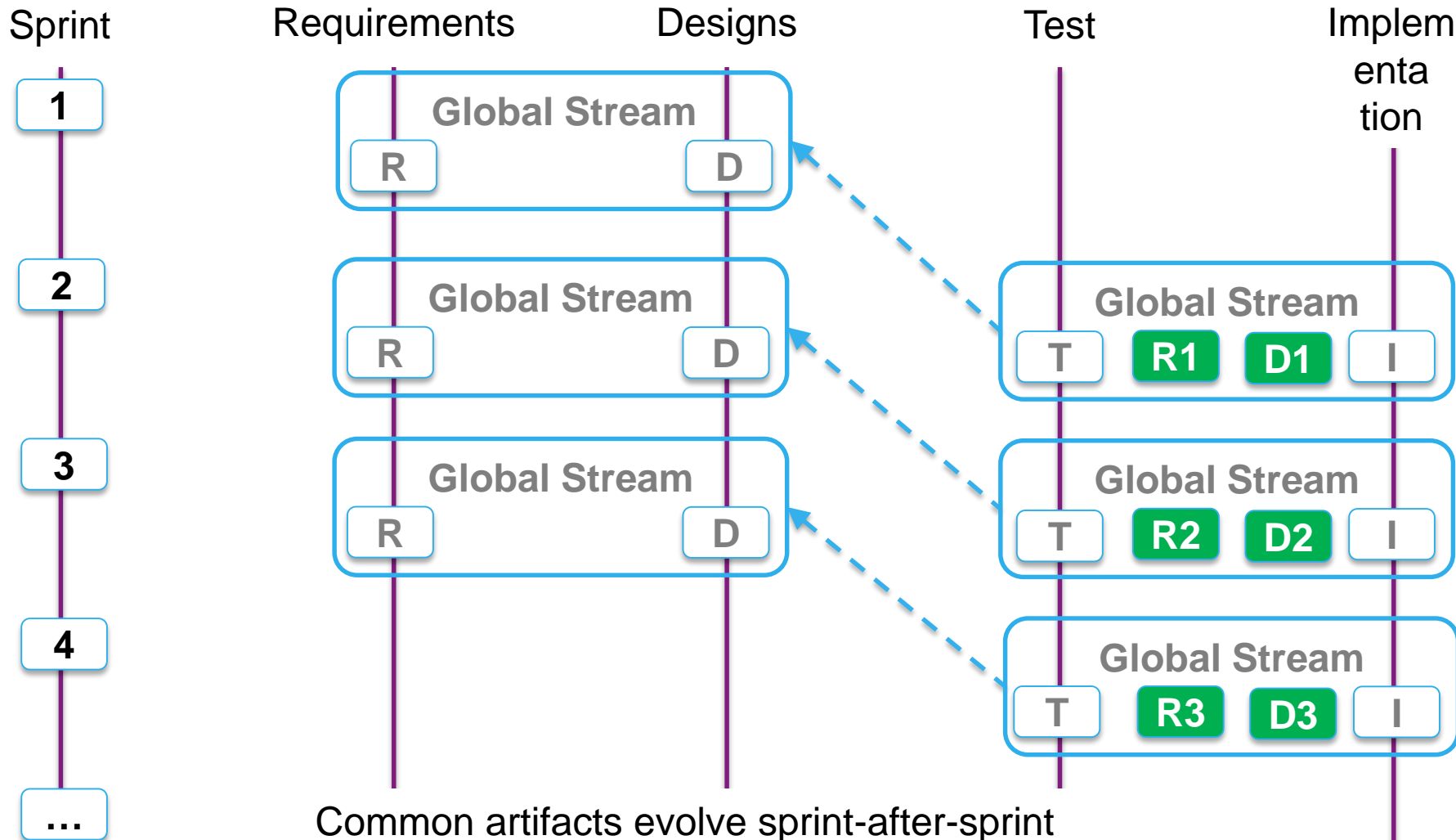
Common artifacts evolve sprint-after-sprint
- Scenario flows / use cases / UI designs …

Progressively expansive baselines

Requirements	Interfaces	Tests	Implementation	Project close-out

B1

B1 ... **D1**

B1 ... **D1** ... **T1**

B1 ... **D1** ... **T1** ... **I1**

⋮ ... ⋮ ... ⋮ ... ⋮ ... ⋮

Bn ... **Dn** ... **Tn** ... **In** ... **Pn**
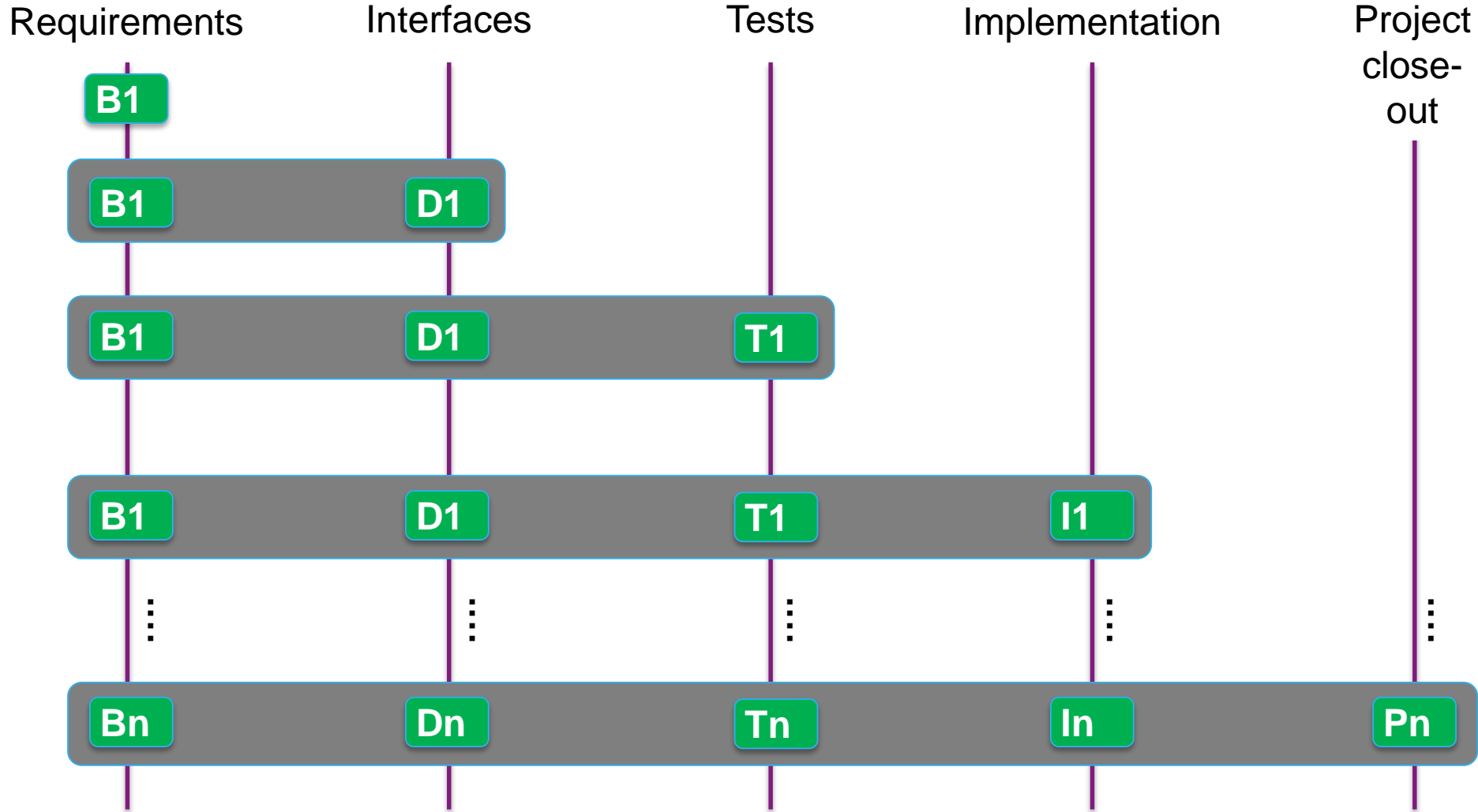
Reuse: Branch from closest

Requirements and tests and …

Each branch is a new product

Product 1

P4

P2

P3

P5
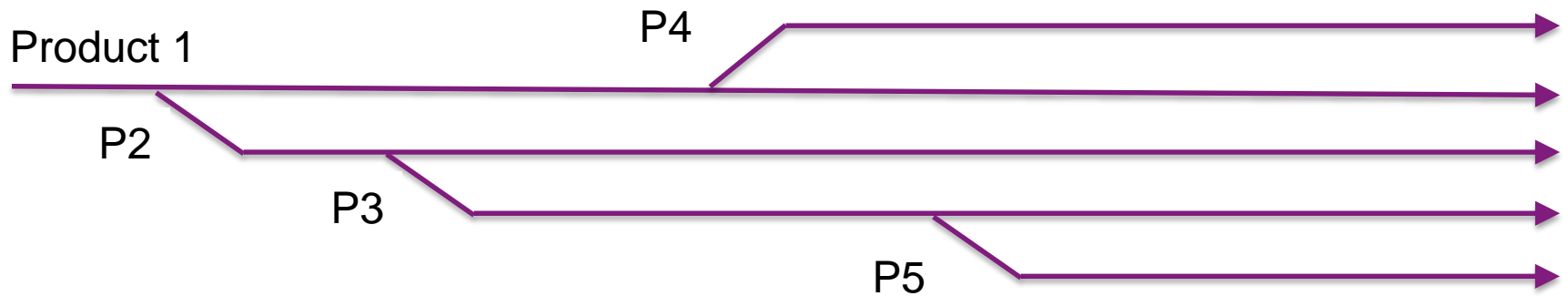
Reuse: Branch from base

Requirements and tests and …
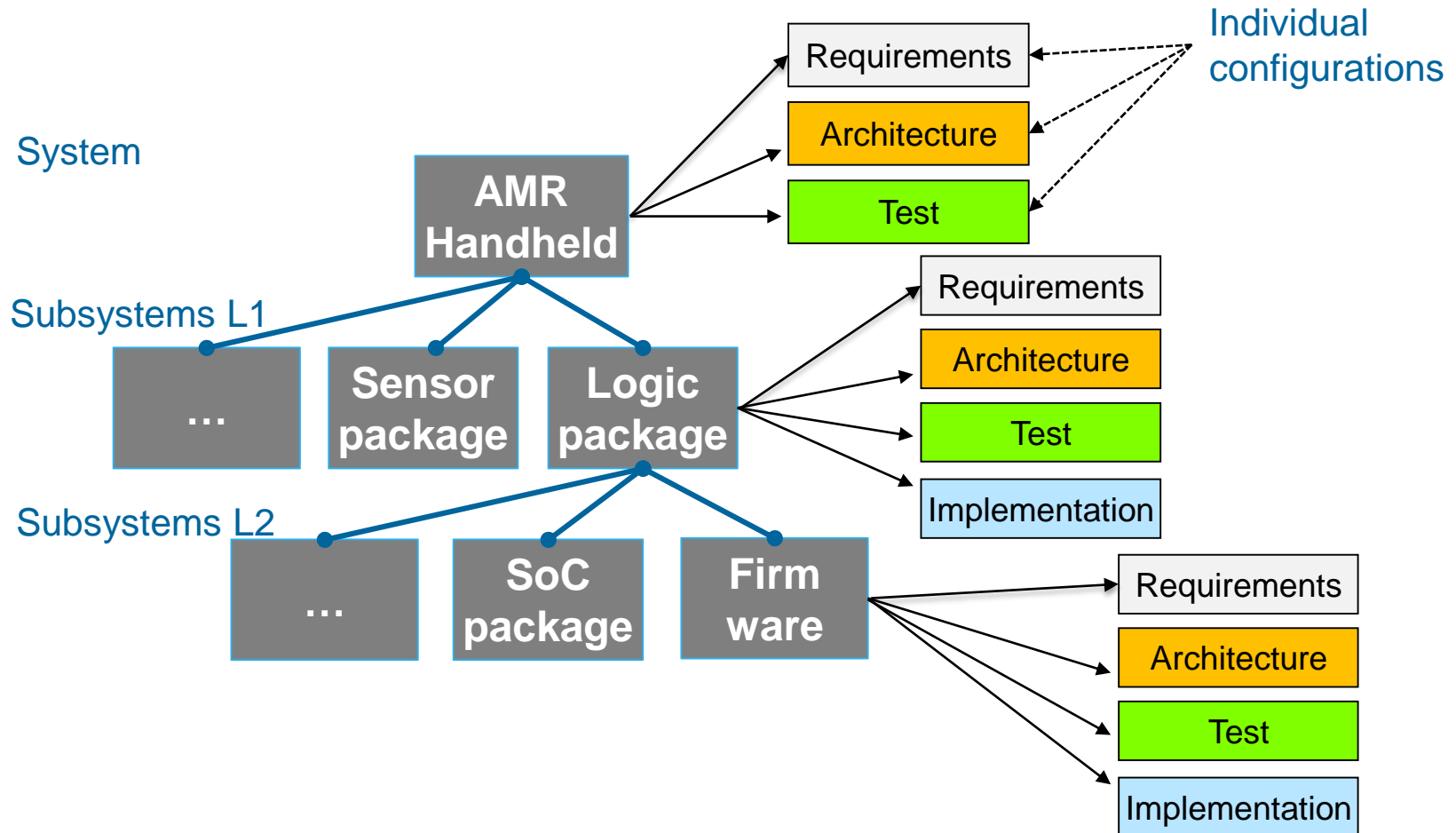
Derive new product from base stream

Platform Development Trunk

P1

P2

P4

P5

P3
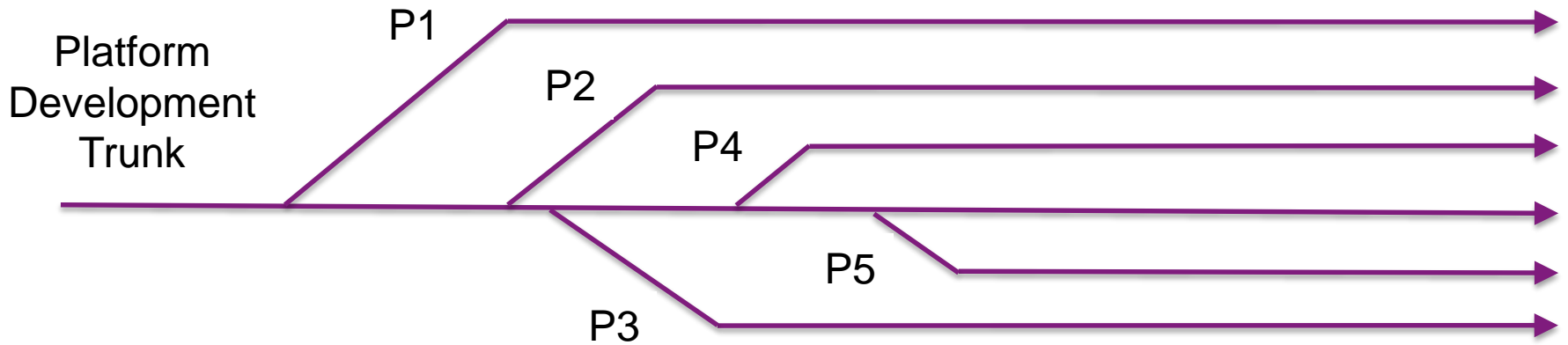
Complex products in a configuration hierarchy

Nested global configurations

Complex products

- Reusable components and sub-systems
  - New Sensor Package in Release B (V1 → V2)
  - Reused Logic Package (V1 → V1)
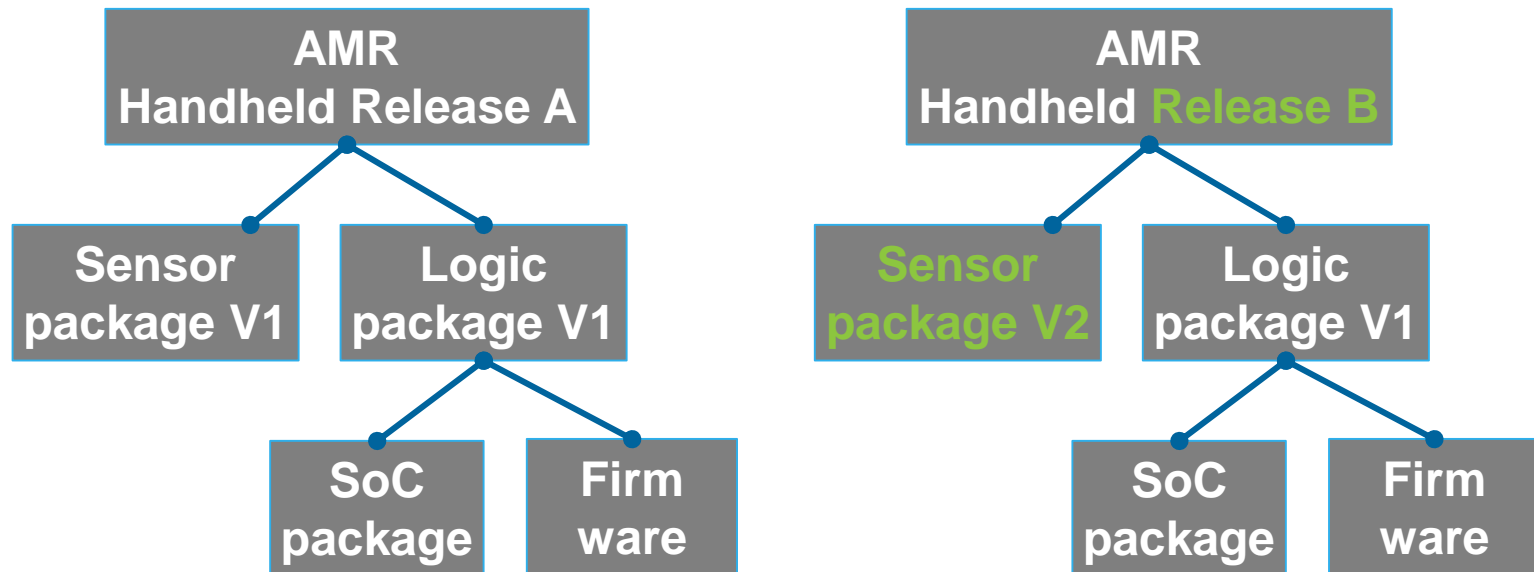
Global configurations

- Composite streams and baselines
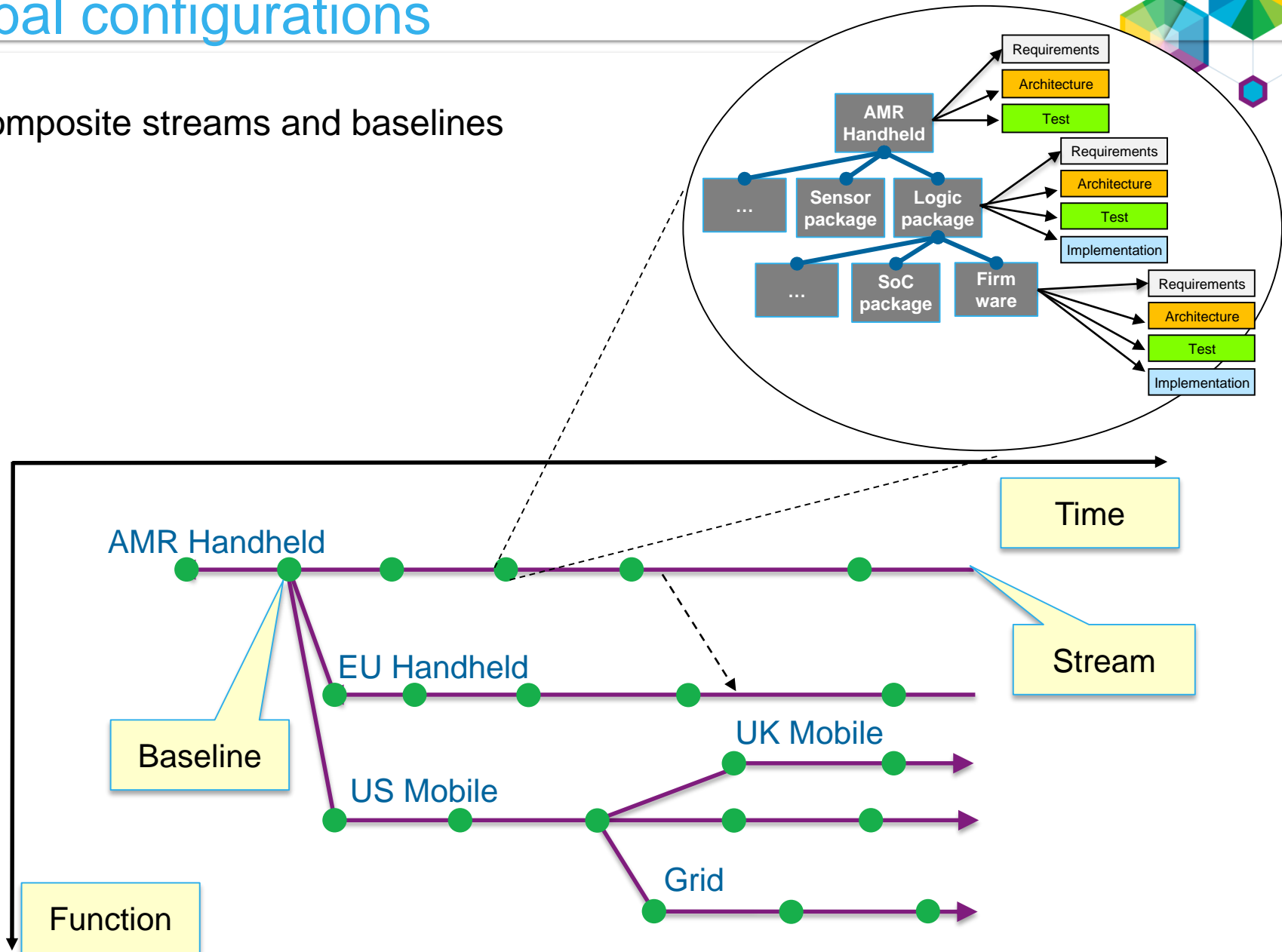
Switch and work in context

Product Configuration Streams for AMR Product Line

AMR   **Manual AMR**   Manual AMR US

Meter Reader UK FP1

Mobile AMR UK

Mobile AMR US

Mobile AMR

Susan
Systems Engineer

Grid AMR US

How do work items fit in?

The recipe …

- Use the OSLC linked data approach
- Create a federated configuration context (a global configuration)
- Artifact versions and links are resolved in this context
- Organize GCs in a hierarchy to reflect complex product/application structure
- Enable tools to contribute their own configurations
- Define a specification for the above through OASIS OSLC

With the result that …

- Links just work
- Changes are isolated in streams
- Baselines reflect the state of the system at a point in time
- Parallel development is much easier
- Reuse is much easier
- Changes are managed more effectively
- Teams are more efficient

Looking over the horizon and speculating

- More automation
- More tools participating in configurations
- ALM / PLM working group

Suggested actions

- Learn more here at InterConnect.
  - Sessions
  - Expo Hall
  - Open Labs

- Watch these four short videos on YouTube:

  [Work Smarter with Configuration Management](#)

- Try the CLM beta at jazz.net.

  M9 blog post: https://ibm.biz/jazzclm-m9

  Introductory blog post: http://ibm.co/1yW4gme

Design Collaborations - Tuesday

11:00 AM	5071A Designing Impact Analysis Capabilities for Product Line Engineering

Design Collaborations - Wednesday

8:00 AM	5078A Designing a Configuration Aware Reporting Solution for Product Line Engineering
2:00 PM	5063A Designing User Experience Concepts in Multi-Stream Configuration Management

Related Sessions - Monday

11:00 AM	DCM-1877 Wow! Configuration management across teams and tools with IBM Rational Jazz
2:00 PM	2116A Unlocking Engineering Knowledge at Qualcomm with Rational Linked Data Technologies
3:30 PM	2150A Strategic Reuse at Motorola Solutions with IBM Rational Continuous Engineering
5:00 PM	2732A How Bosch Uses Rational Team Concert SCM in the Reuse-Driven Automotive Industry

Related Sessions - Tuesday

8:00 AM	2212A Leveraging Global Configurations to Baseline across IBM's Collaborative Lifecycle Management Suite

Related Sessions - Wednesday

9:00 AM	Managing Reuse and Product Line Engineering with Rational Team Concert - 3650A (Meet the experts forum)
11:00 AM	2294A Understanding Rational DOORS Next Generation Change Sets: Work Item Traceability and Delivery
12:30 PM	4431A Product Line Engineering Comes to the Boardroom: A Unified Product and Portfolio Management Strategy
5:30 PM	4808A pure-systems: Variant Management: Solutions That (Don't) Work

Related Sessions - Thursday

1:00 PM	4918A The End of Cloning: Strategic Reuse and Product Line Engineering with the Rational Platform
2:30 PM	2133A Configuration Management of Requirements in IBM Rational DOORS Next Generation
2:30 PM	1120A Best Practices for Reusing Requirements in Continuous Engineering

Related Sessions - Thursday

1:00 PM	4918A The End of Cloning: Strategic Reuse and Product Line Engineering with the Rational Platform
2:30 PM	2133A Configuration Management of Requirements in IBM Rational DOORS Next Generation

Summary

- The advanced configuration management capabilities you depend on (CC, RTC SCM, others …) are now available for other development artifacts and job roles on your team

- Your control over and visualization of reuse is greatly expanded

- Your team can do their work in a product context and a project/plan context

Thank You

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The What and Why of Configuration Management

What is Configuration Management, and why do I need it?

- Keeping track of versions of individual artifacts (configuration items)
- Keeping track of versions of the system as a whole (baselines)
- Tracking who changed what, when, and why (change management)
- Managing, monitoring, and enforcing policies for all the above

Configuration Management is often mandated by regulations, but even where that is not the case, it is required for your sanity! With the pace and complexity of engineering, keeping track of which changes went into a given system, and which changes are still pending or required, is a fundamental discipline.

Moreover, while Software Configuration Management has been standard practice for many decades, with the increasing importance of embedded software, model-based development, quality management, and similar tools, the need to manage versions of artifacts other than source code is increasingly evident.
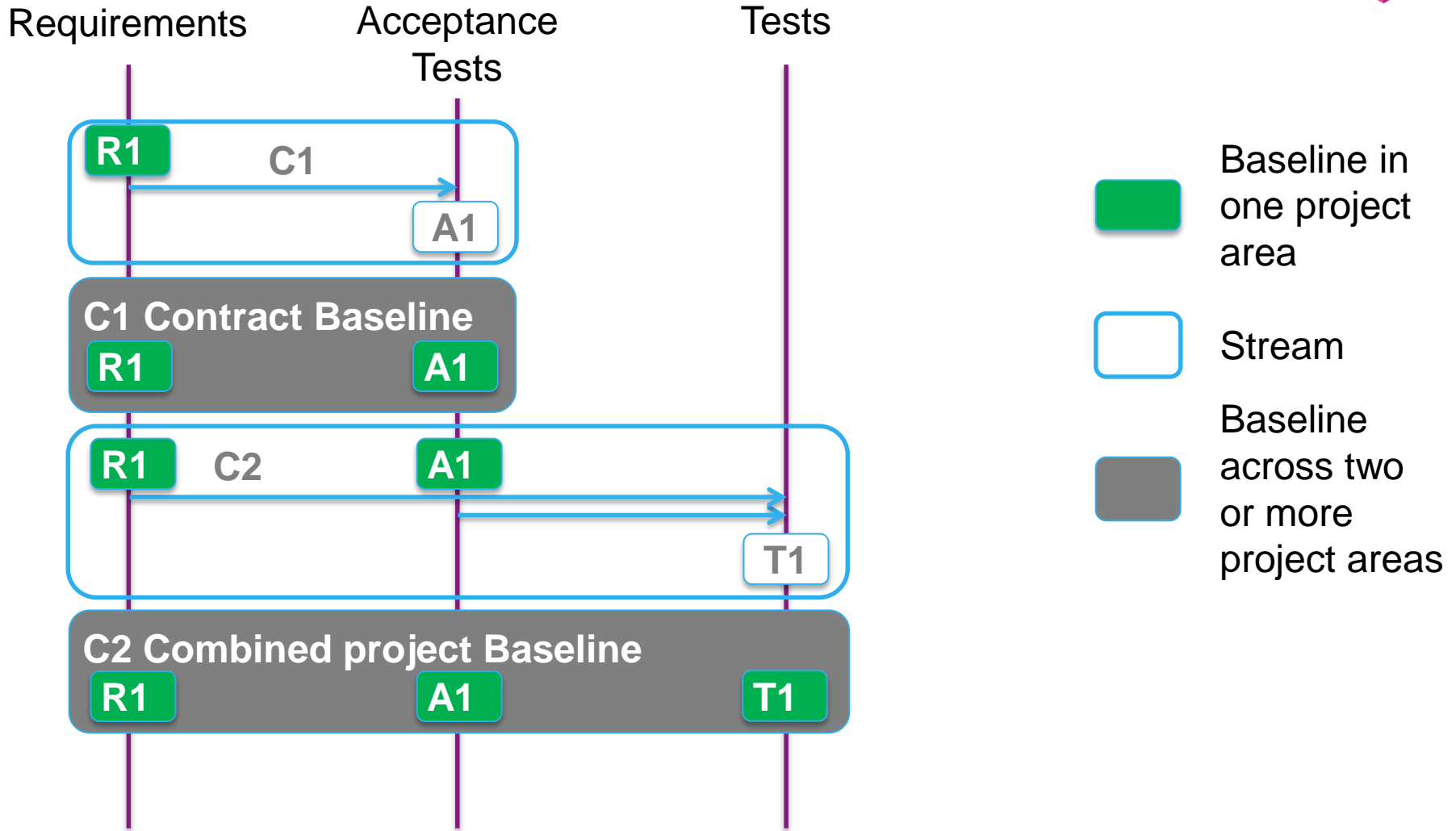
What is in a configuration?

- Obviously, versions of the artifacts – not just source code
    - Requirements, designs, documents, test plans, test cases
    - Source code as well, of course!
- Build environment – often neglected
    - Type systems, database schemas
    - Tools, scripts, compilers, library and operating system version and patch information
    - User environment (options, settings, ini files, config files, etc.)
- Revision history, including change comments
    - who changed what, when, and why.
- Links between artifacts
    - Links need to be versioned just as other properties of artifacts
    - And then navigated in the context of the relevant configurations (including baselines)

In a contractual environment

Requirements   Acceptance Tests   Tests

R1   C1 → A1

C1 Contract Baseline
R1   A1

R1 C2 A1 → T1

C2 Combined project Baseline
R1   A1   T1

Baseline in one project area

Stream

Baseline across two or more project areas

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