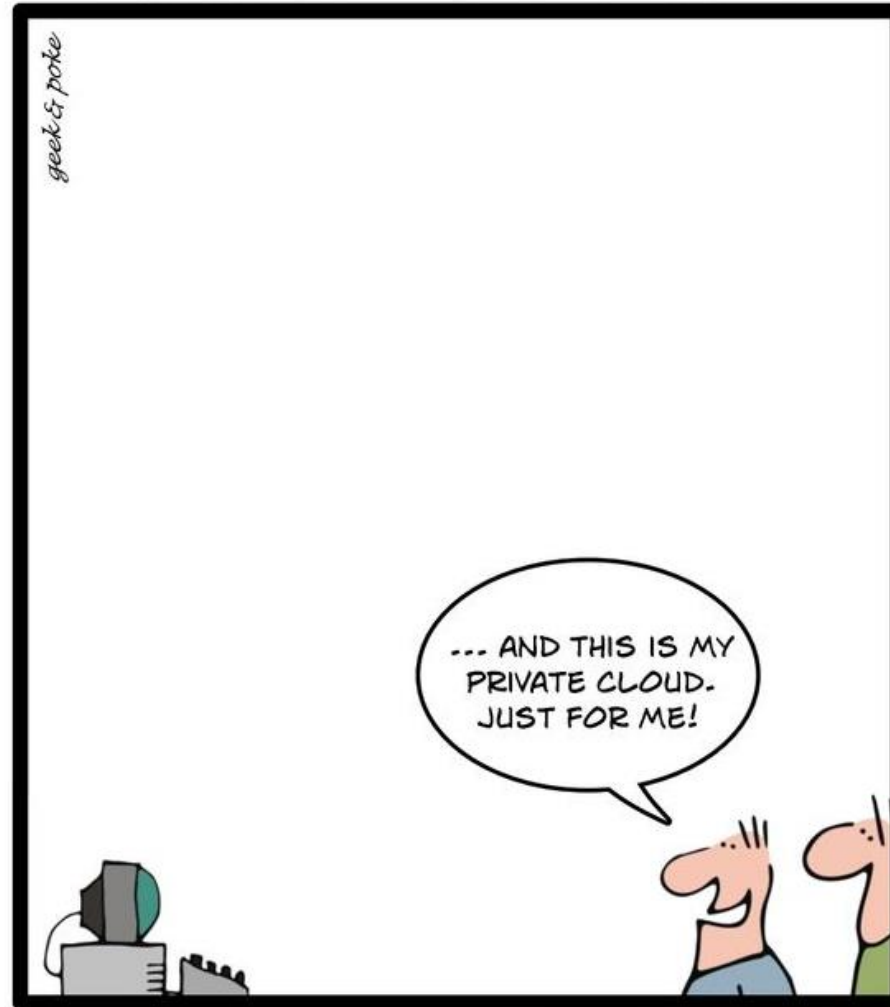


DEVELOPMENT TOOLCHAIN ON STEROIDS

MICHAEL KOLB

THE HISTORY OF THE CLOUD - PART 1



1980: THE PC WAS BORN

<http://geek-and-poke.com/> [CC BY 3.0]

About me

Michael Kolb



- Chief Architect for Cloud-Projects @ Robert Bosch in Stuttgart, Germany
- 10 Years+ as Architect and Head of development for IoT & Cloud Projects

#Blogger, #Open Source Contributor, #Cloud Native

About us

Robert Bosch GmbH - Business units

Mobility Solutions



**Industrial
Technology**



**Energy and
Building
Technology**

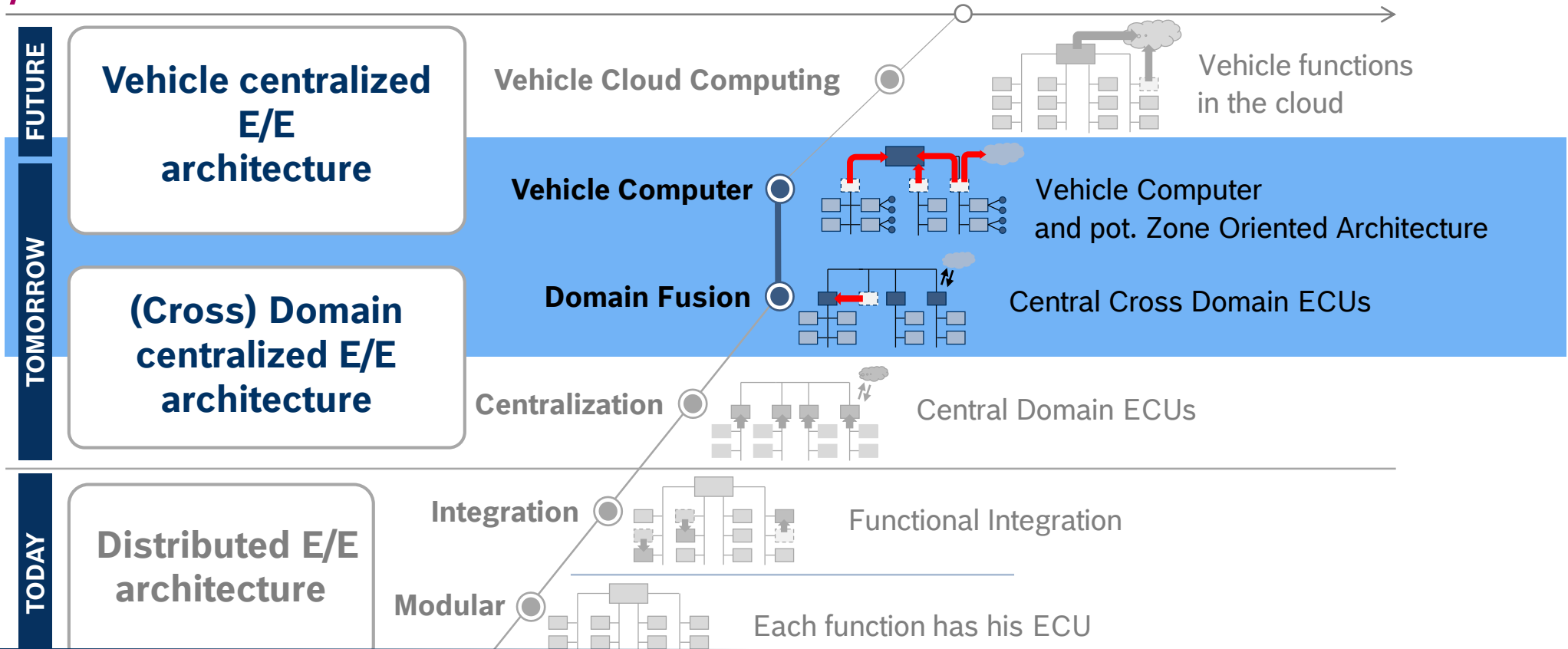


Consumer Goods



About us

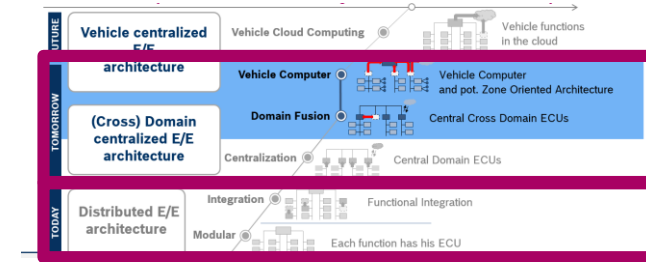
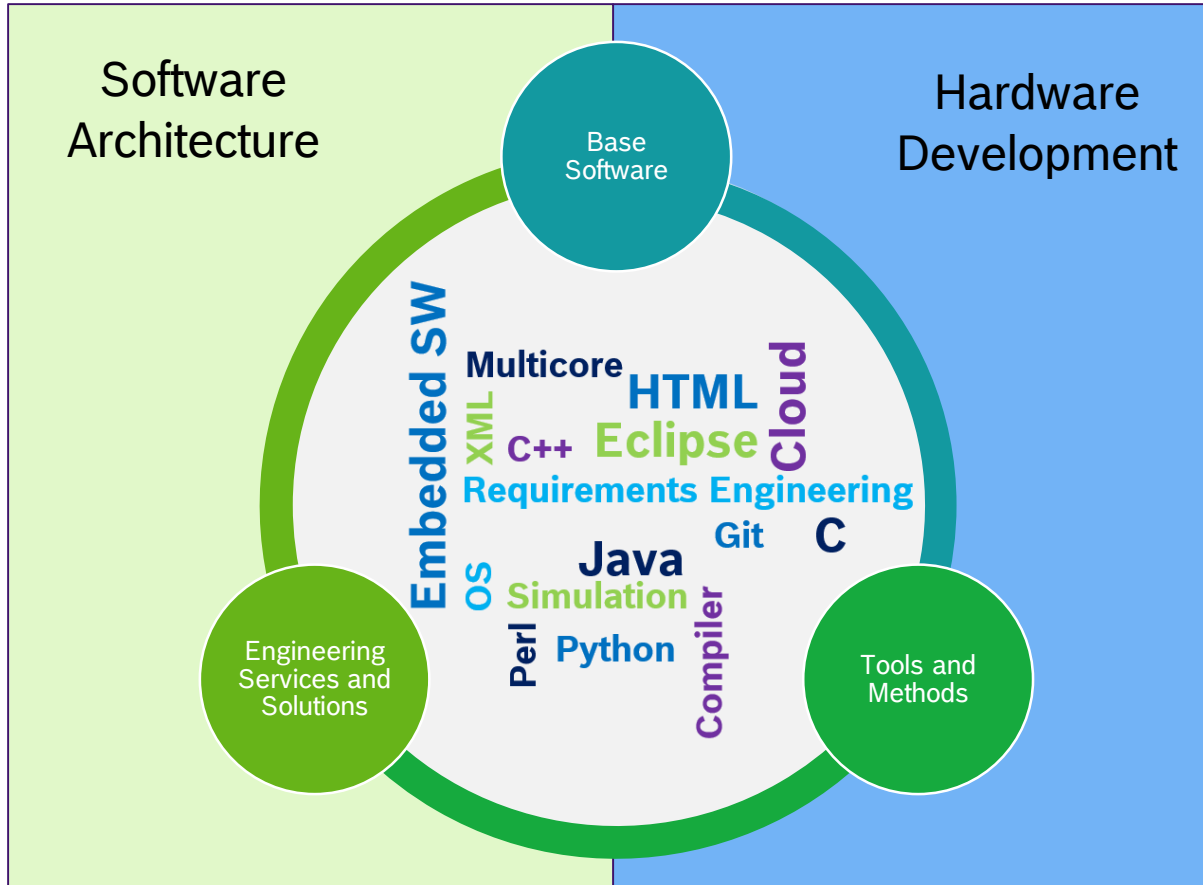
E/E Architecture Trend



New E/E-Architectures are driving new SW-Architectures

About us

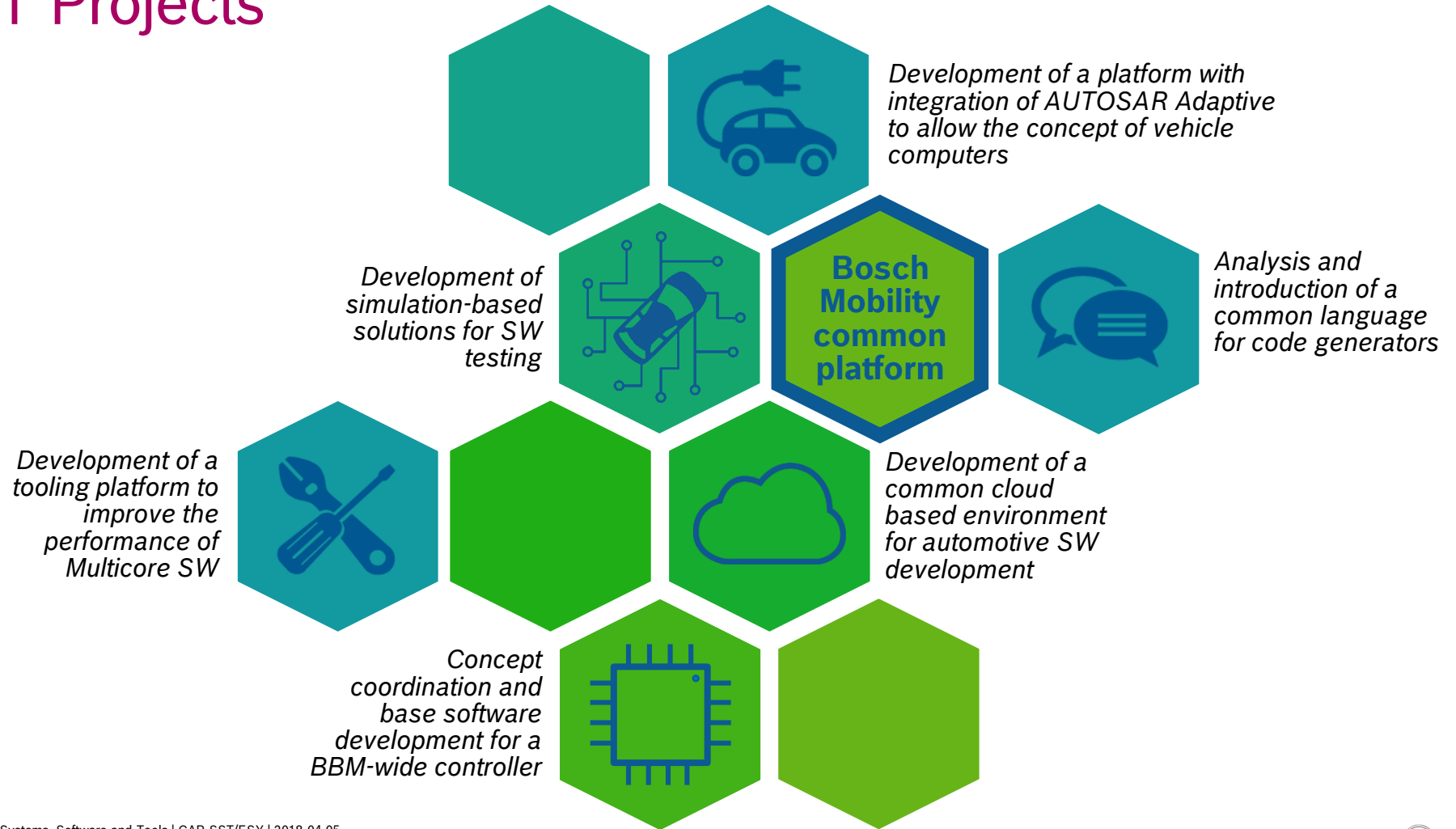
Cross Automotive Platform – System, Software, Tools



**Bosch Mobility
Solution
common
platform**

About us

CAP-SST Projects



THE GOOD, THE BAD, THE UGLY

LOCAL DEVELOPMENT ENVIRONMENTS

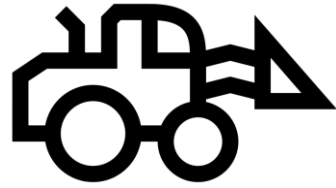
How does the classic local environment look like?

Components

Datcenter



Static Code analysis



Buildserver



SCM

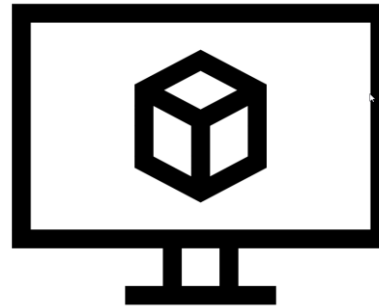


Ticket System



Artifact Storage

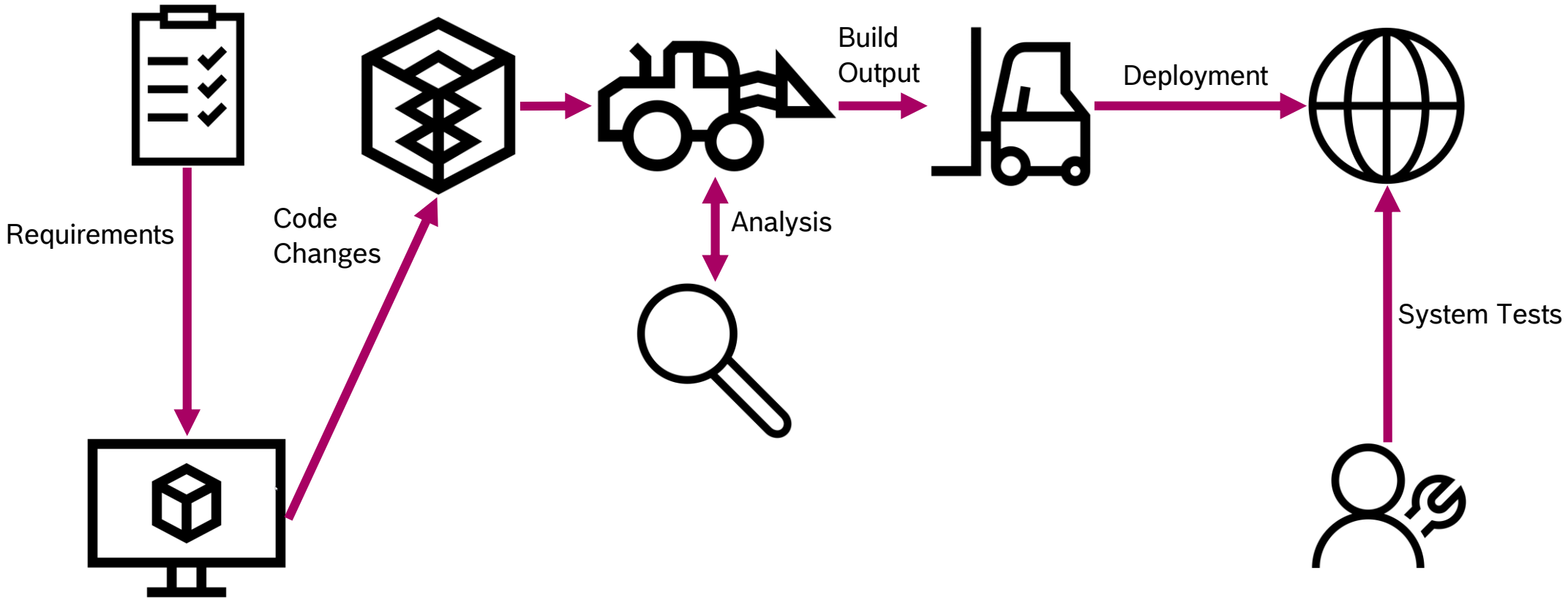
Local Machine



IDE, Compiler, Clients,
other Tools

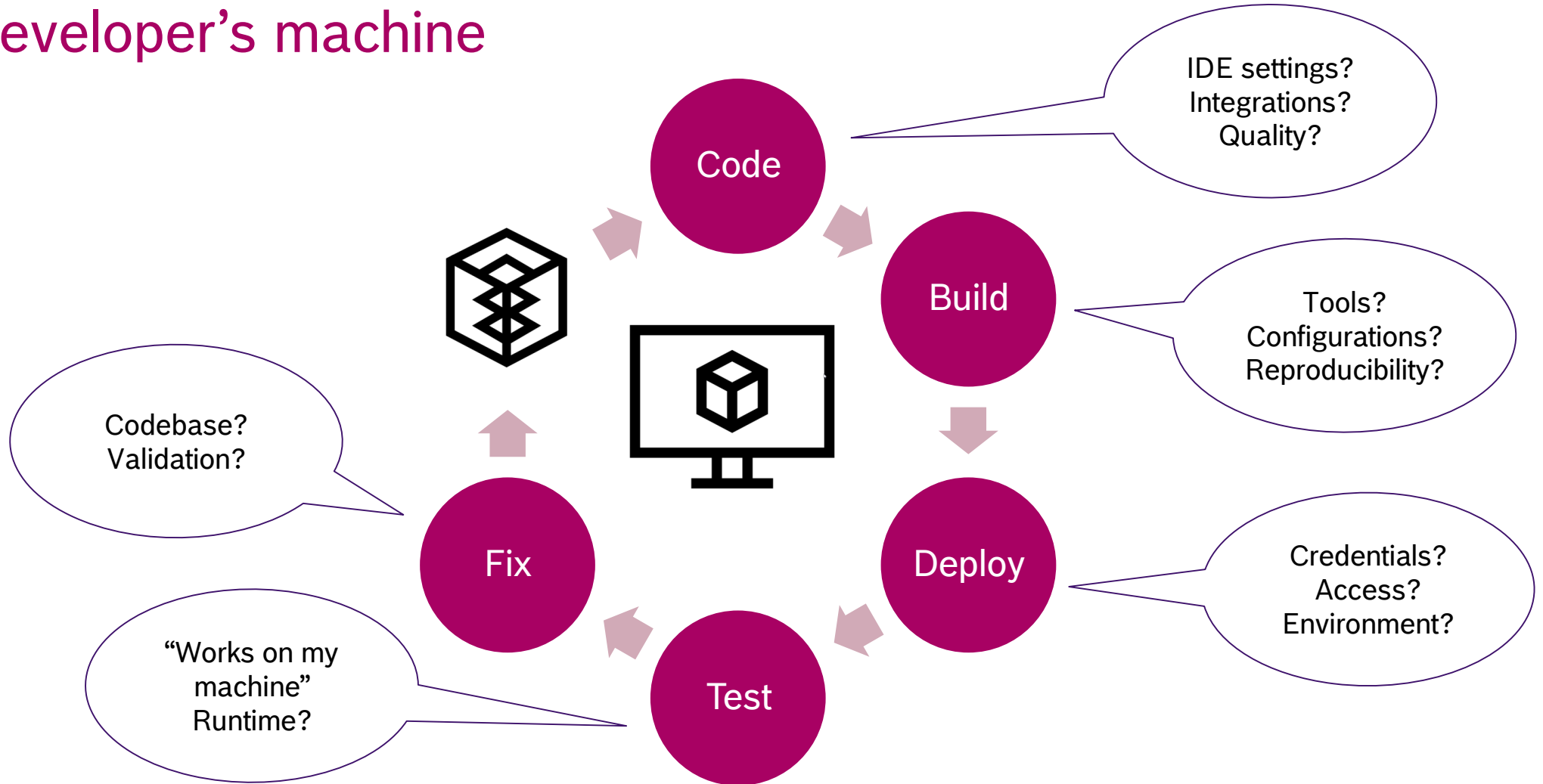
How does the classic local environment look like?

Process



How does the classic local environment look like?

Developer's machine

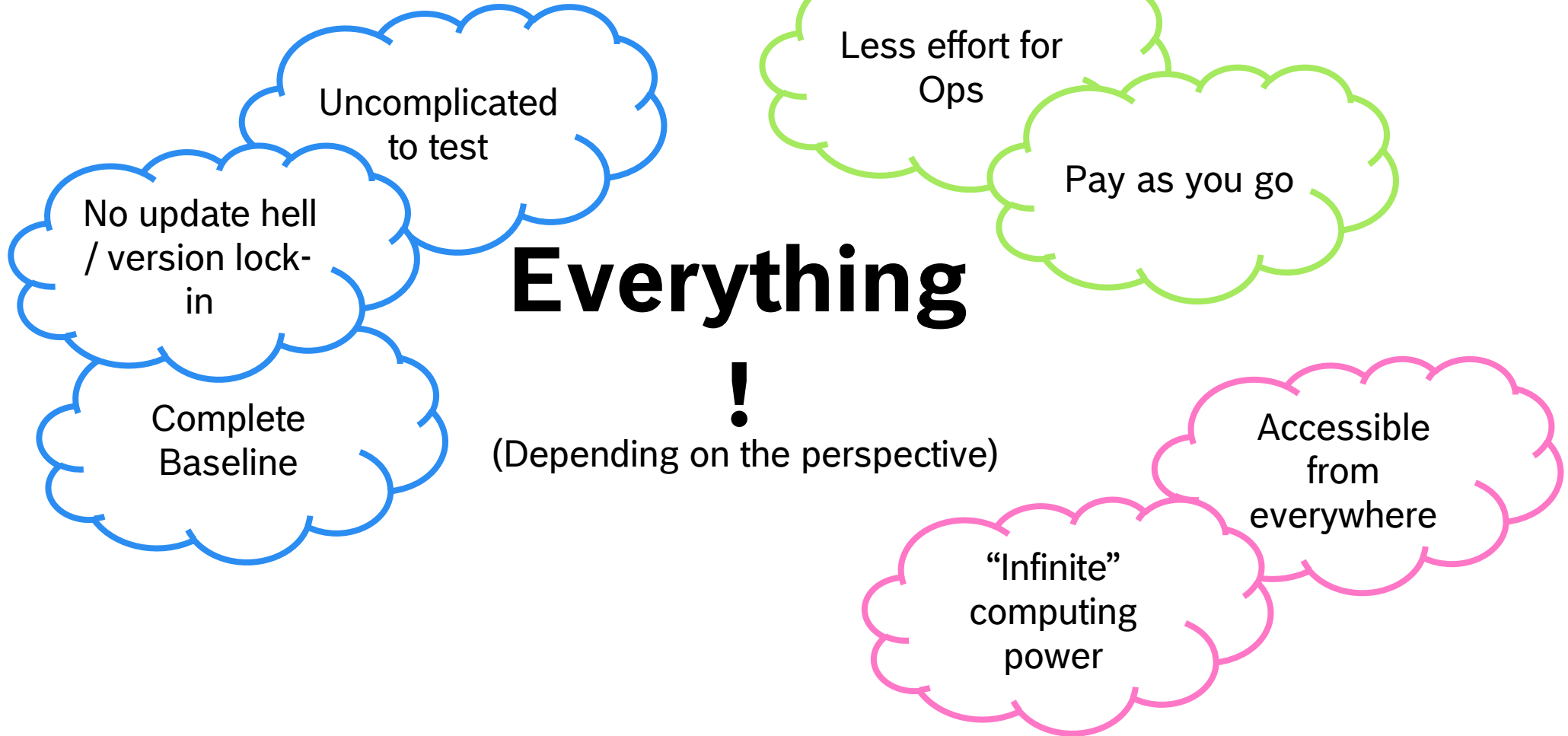


HOW DOES CLOUD HELP

ADVANTAGES OF A CLOUD DEV- ENVIRONMENT

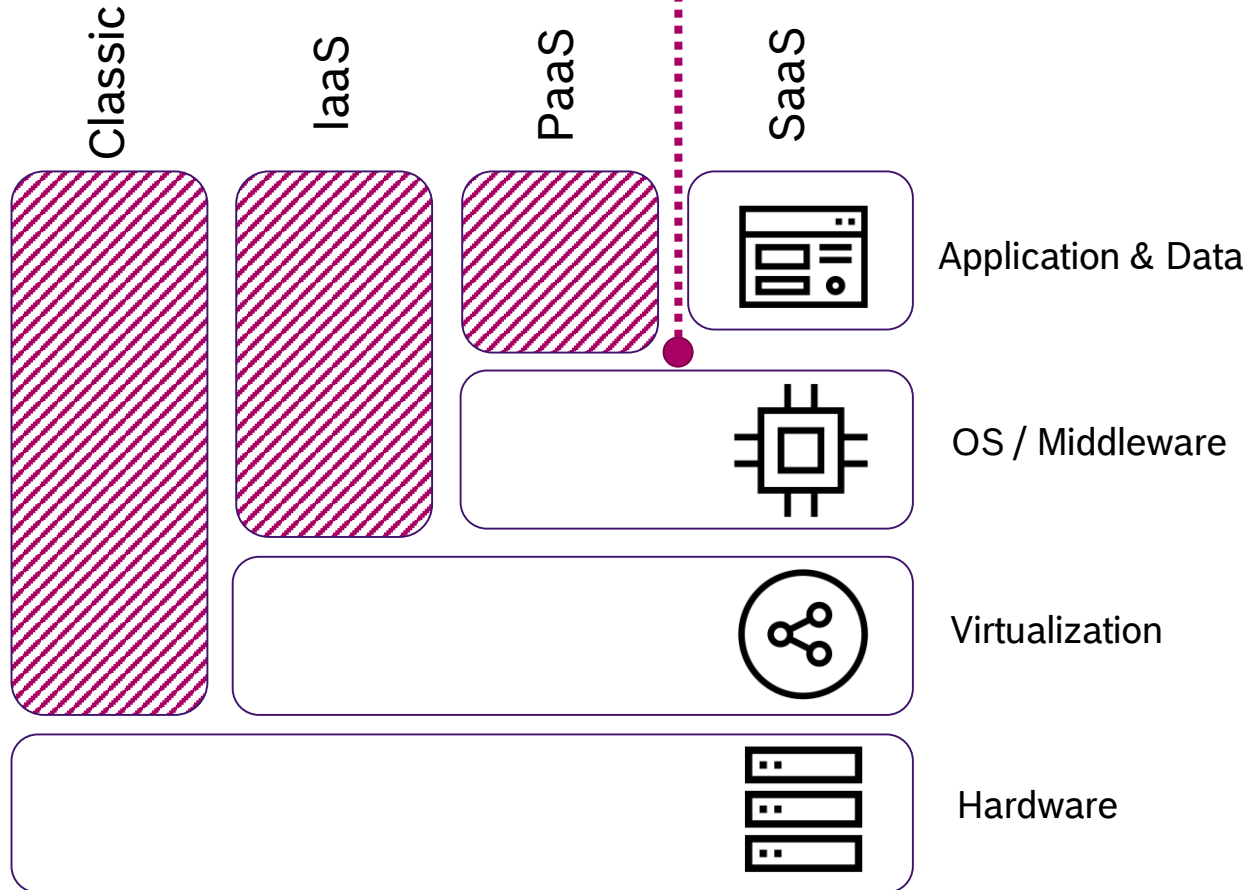
Cloud development environments

What can be solved better?




Cloud development environments

*aaS



CaaS

- Infrastructure (and OS) are abstracted
- No provider lock
- High portability
- Scalability

 Your Job

Cloud development environment @ Bosch

Deciding for a cloud provider

The question is:

Do you really need to decide for one?

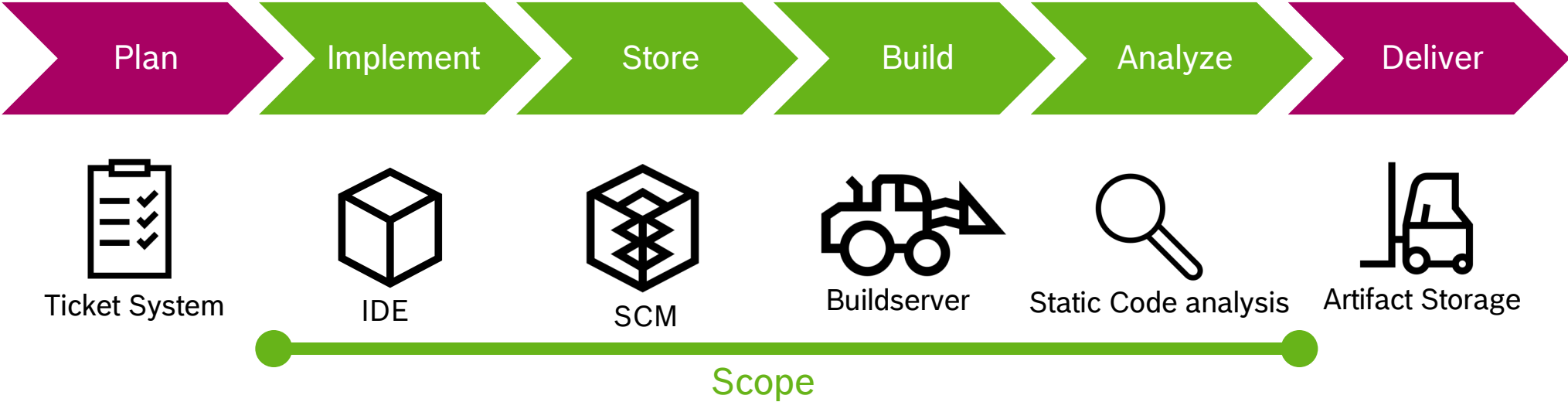
No you don't, but...

THE TECHNICAL STUFF

ARCHITECTURE. TECHNOLOGIES.
PITFALLS.

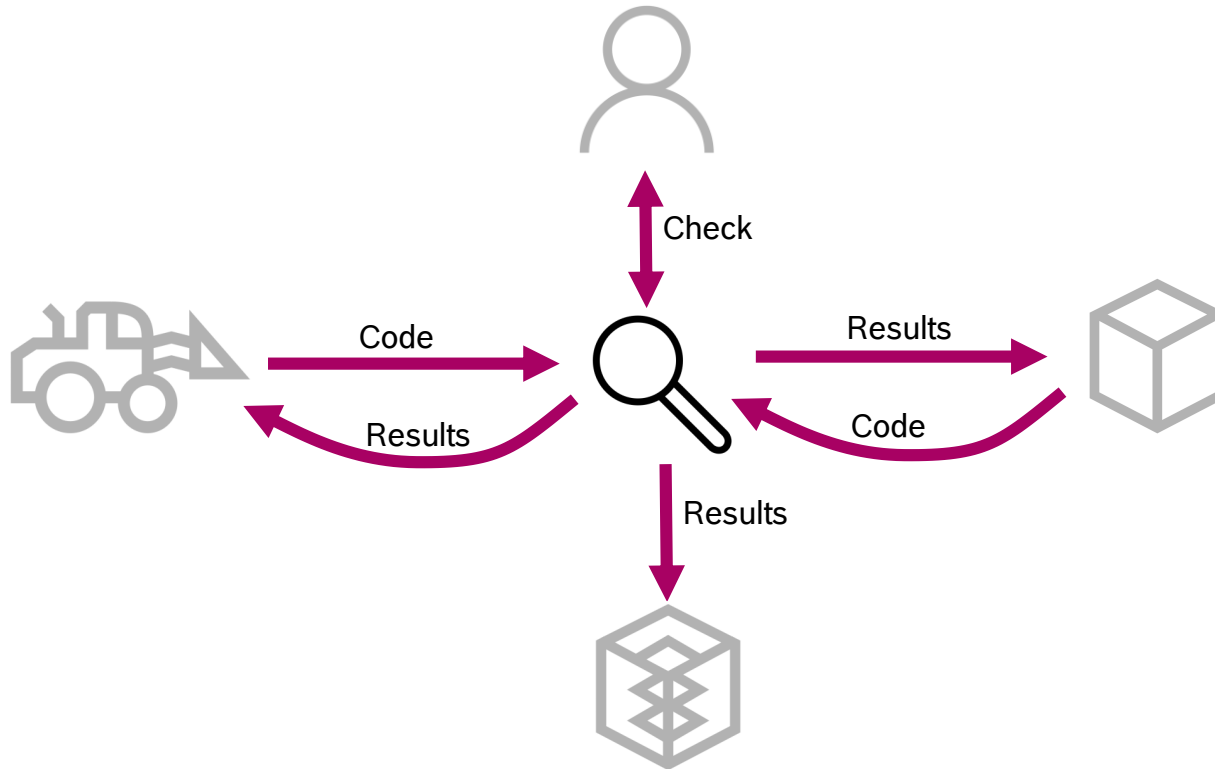
Cloud development environment @ Bosch

Scope of the technical part



Cloud development environment @ Bosch

Building Blocks: Static code analysis



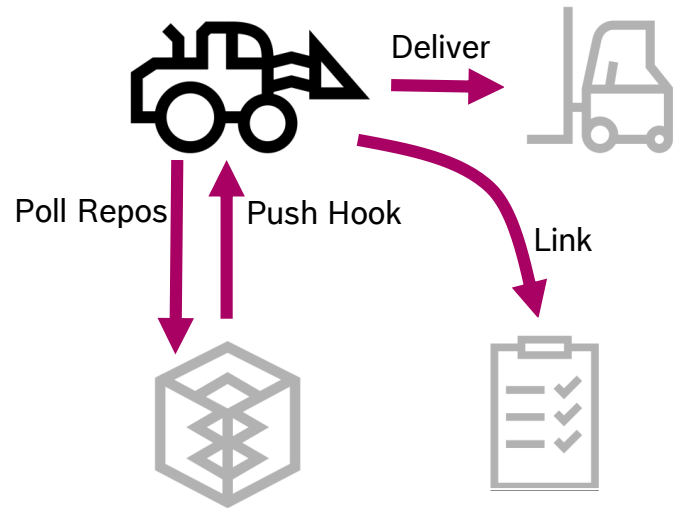
- Analysis for each commit
- Local analysis possible
- Sonar as automated reviewer
- Build Breaks on
 - Quality gate fail
 - “Red” Issue increase

Cloud development environment @ Bosch

Building Blocks: Buildserver



src: wiki.jenkins-ci.org/display/JENKINS/Logo



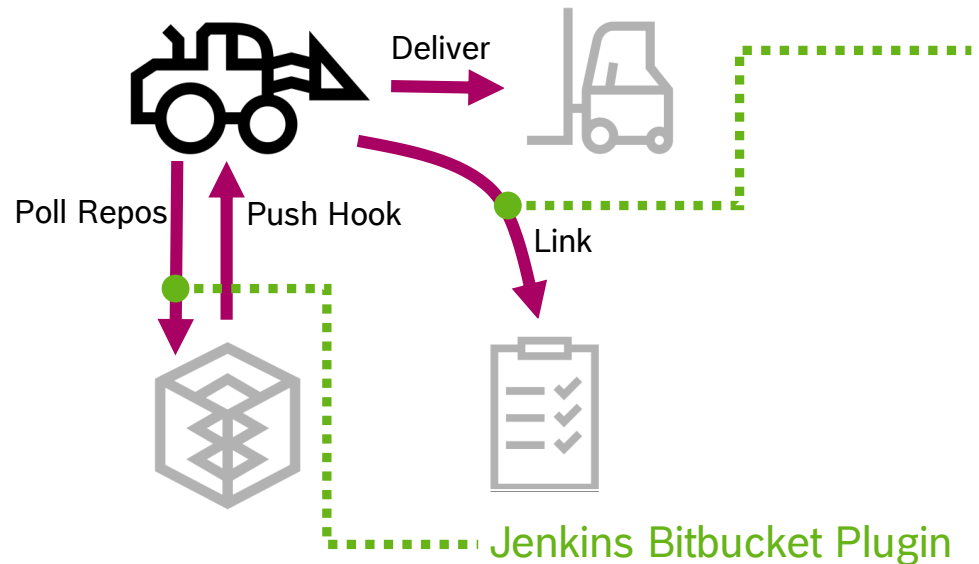
- Pipeline in Repository
- Zero configuration (except secrets)
- Build contains
 - Compile
 - Analysis
 - Versioning + Tag
 - Unit-Test, I-Test and Sys-Test execution
 - Delivery
- Execution in Docker containers
- Max 10 minutes until you get feedback

Cloud development environment @ Bosch

Building Blocks: Buildserver



src: wiki.jenkins-ci.org/display/JENKINS/Logo



Custom Service

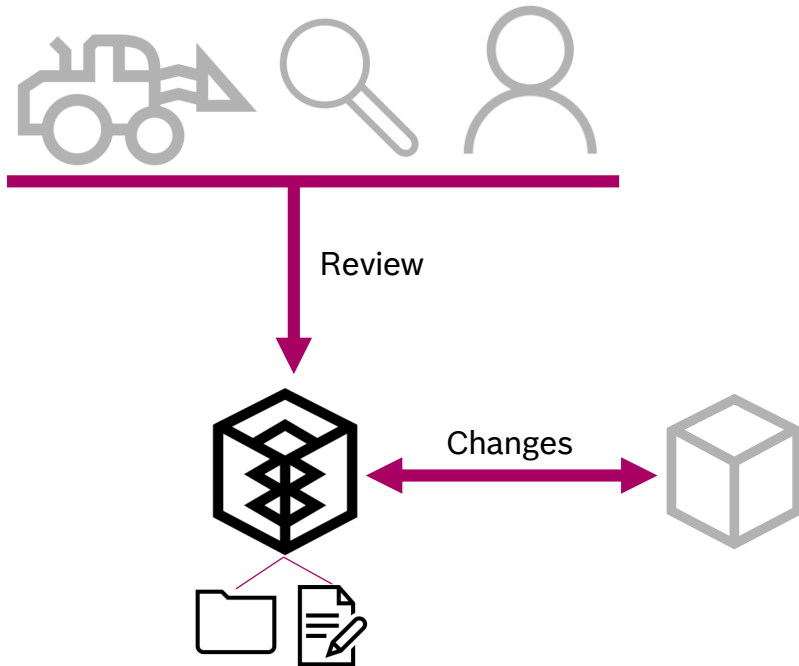
- Microservice that consumes “Successful Build events”
- Utilizes REST-API of Ticket System to create links to build artifacts on Nexus

Jenkins Bitbucket Plugin

- Checks BB REST-API for new / changed repositories
- Creates new Build-Plans based on Pipelines in the repository
- Provides Webhook Endpoint to trigger builds

Cloud development environment @ Bosch

Building Blocks: SCM



- Distributed System
- Reviews are done by
 - Jenkins: “Green Build”
 - Sonar: Quality Gate passed, “Red Issues”, Code Coverage
 - Developer: Based on a review guideline → Knowledge sharing
- Only approved Pull-Requests can be merged

Principle: “Everything that was approved by Sonar & Jenkins is considered to be valid”

Cloud development environment @ Bosch

Building Blocks: IDE - Terminology



src: eclipse.org/che/

Stack

- Generic recipe for creating a workspace for a specific technology
- Contains one or more references to containers

Factory

- Produces workspaces based on the recipes defined in a stack
- Holds the configuration values for variables in a stack

Machine

- Single container inside a workspace
- “Virtual” Computer

Workspace

- The instance of a stack
- Defines the environment where IDE actions are executed

Che Server

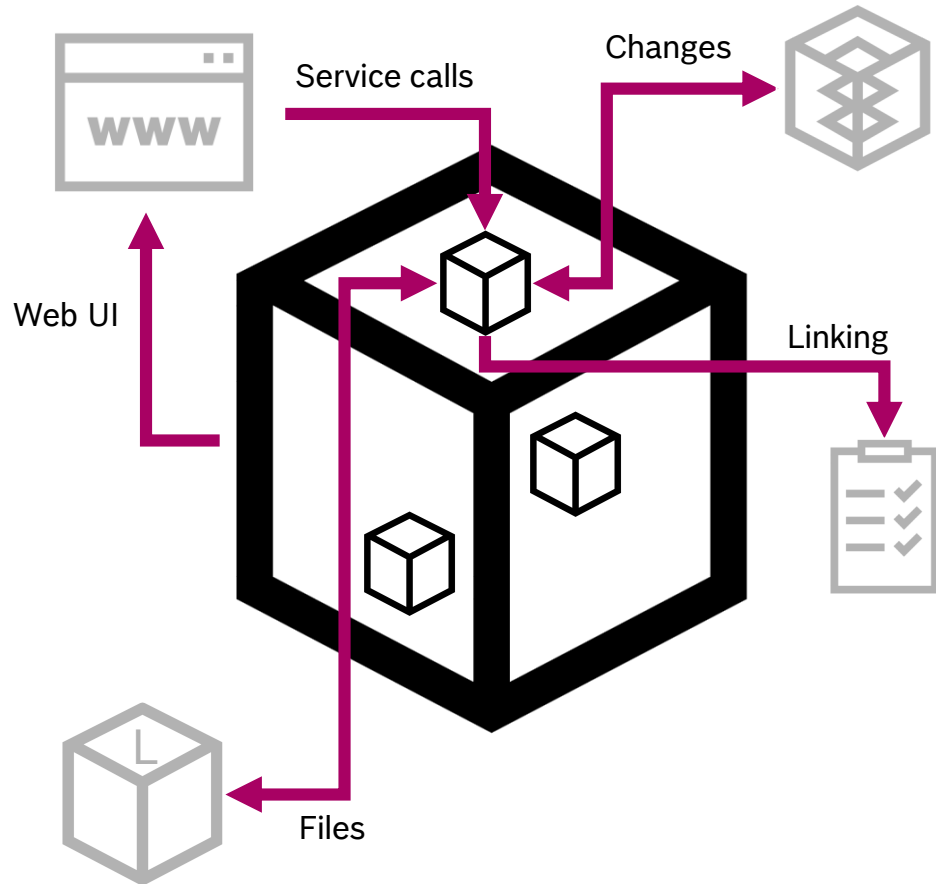
- Master-Controller of all workspaces
- Serves the Web-UI

Cloud development environment @ Bosch

Building Blocks: IDE - Overview



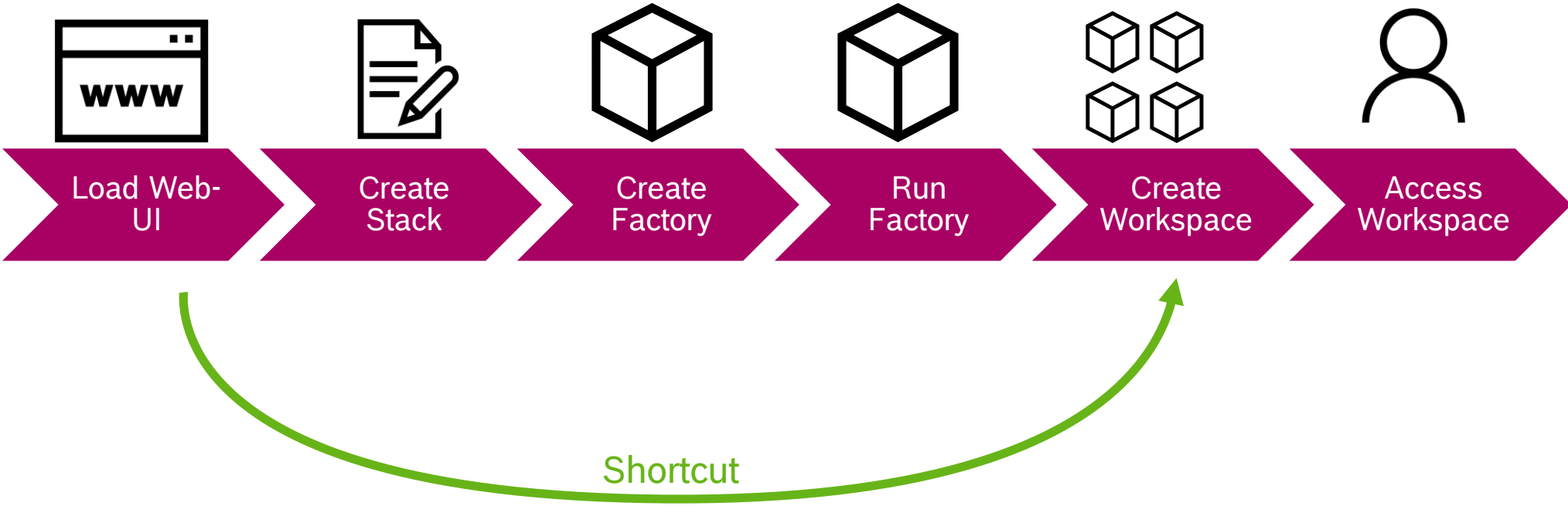
src: eclipse.org/che/



- Web-Based IDE
- “Workspace manager”
- Support for custom “Stacks”
- Workspaces consist of one or more containers
- Support for integration into local IDE

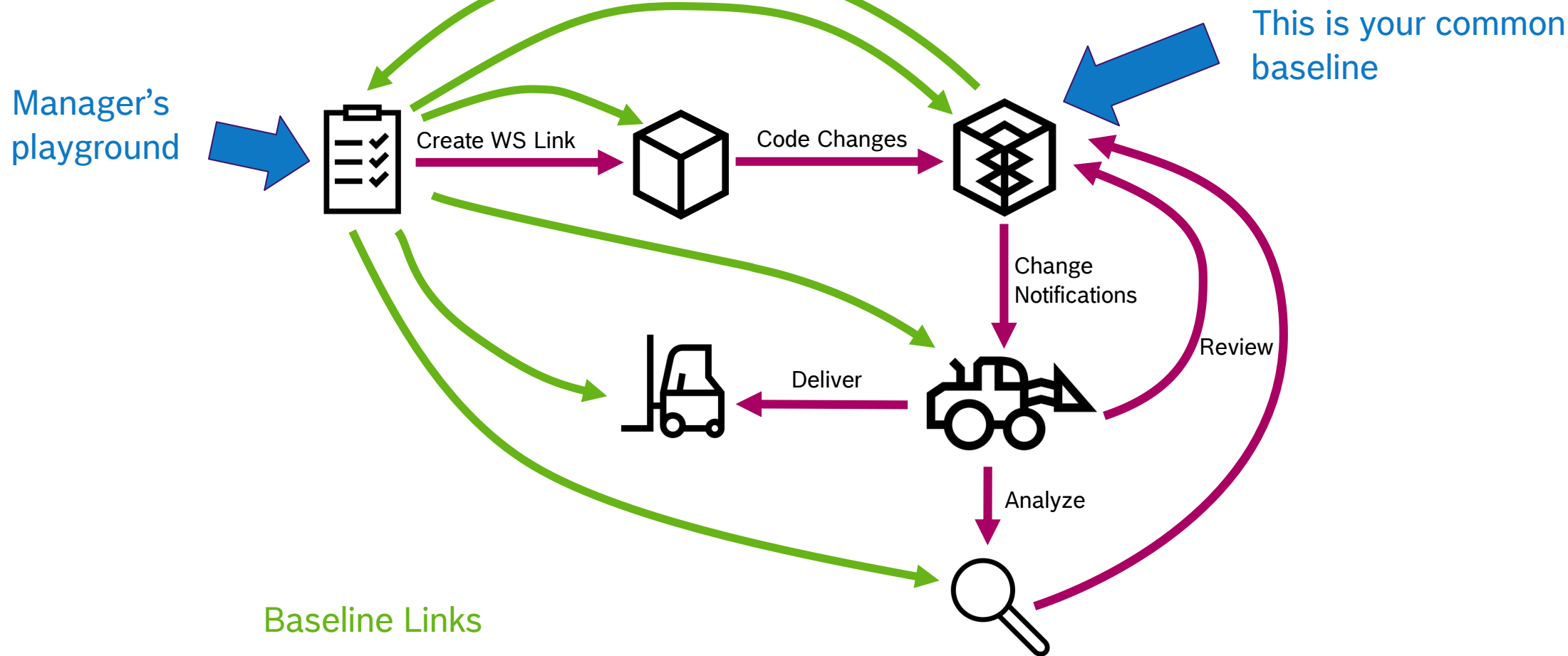
Cloud development environment @ Bosch

Building Blocks: IDE - Workflow



Cloud development environment @ Bosch

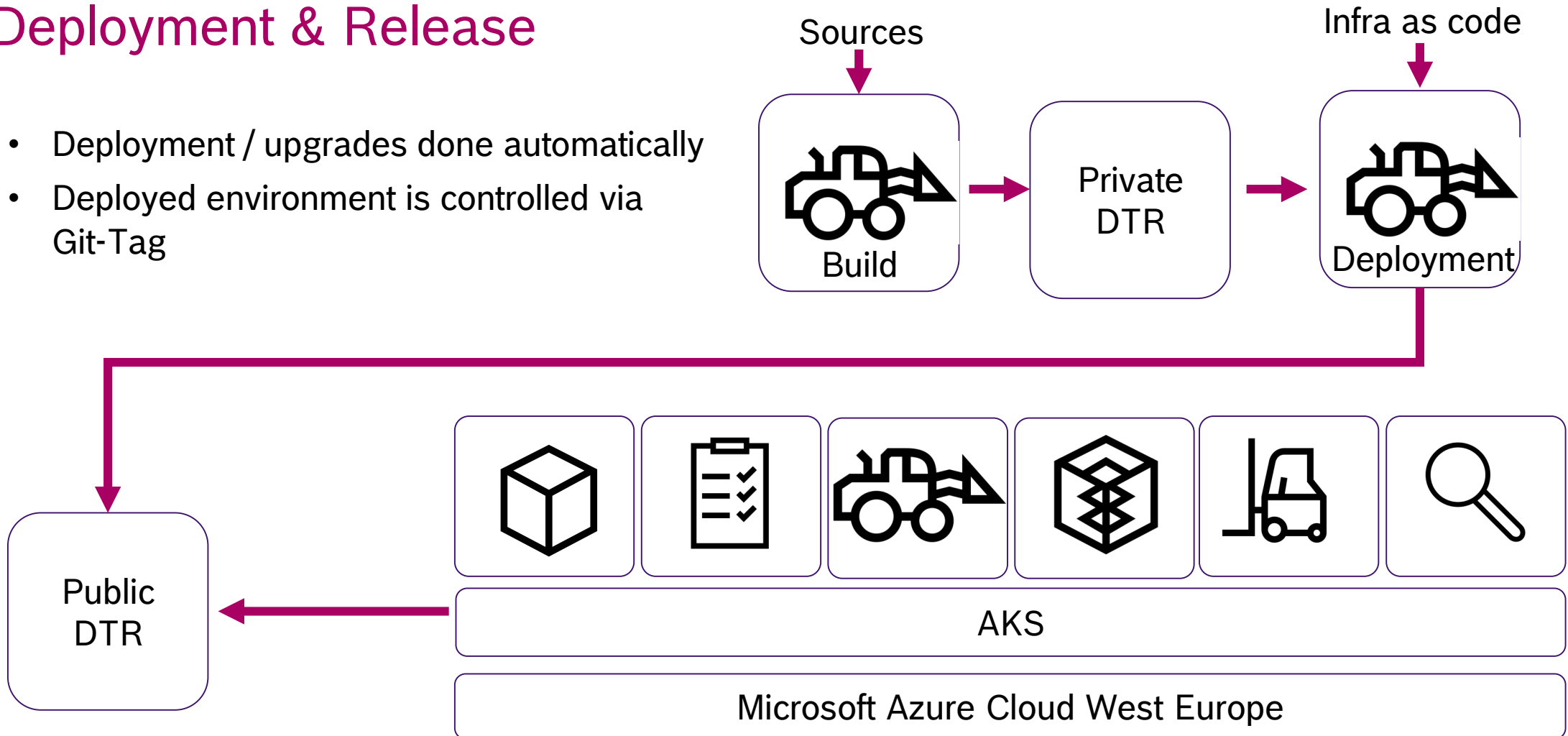
System overview



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Deployment & Release

- Deployment / upgrades done automatically
- Deployed environment is controlled via Git-Tag



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Benchmark

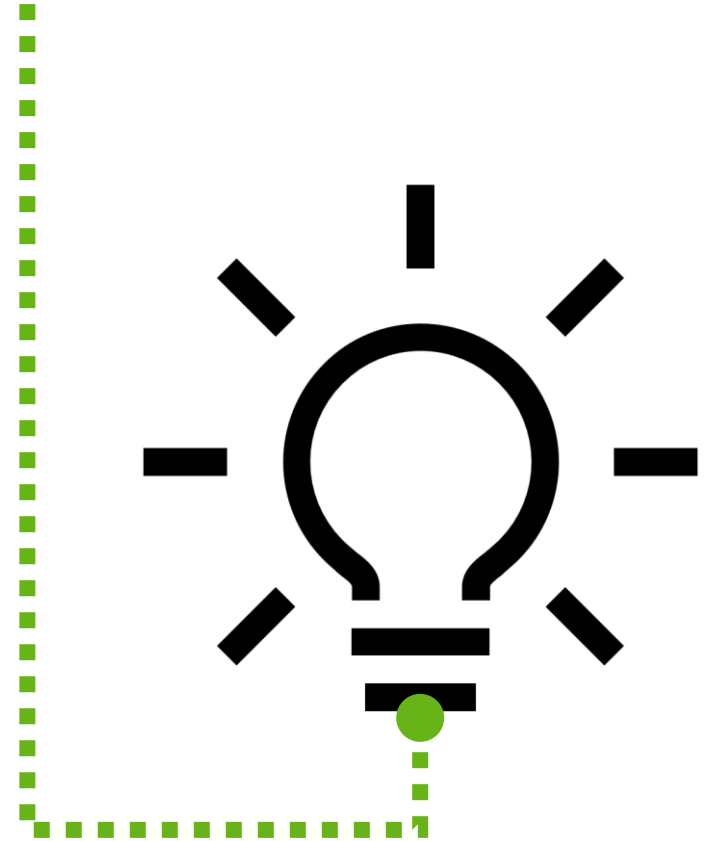
- ▶ Decreased build times by factor 3 (average)
 - ▶ Parallel Testing, even for System Tests
 - ▶ Dynamic scaling of build CPUs
- ▶ No dedicated Operations needed anymore
- ▶ Cooperation is much more likely to happen
- ▶ Main accepted Use cases so far
 - ▶ IDE for “smaller” pieces of code (e.g. reviews)
 - ▶ Back-in-Time Machine for old Build environments



Cloud development environment @ Bosch

Rumors. Prejudices. Lessons learned.

- ✓ Docker can be a problem
- ✓ Be provider agnostic wherever possible
- ✓ Hold everything inside your repository (Code, Infrastructure, Architecture, Documentation, Build, Configuration, Machines, ...) – Everything!
- ✓ Do not split Dev and Ops
- ✓ Automate your quality measures



THANK YOU

WE KEEP IN TOUCH

MICHAEL.KOLB3@BOSCH.COM

*We are hiring!
Visit us at our booth 27*