DevOps and TFS

A Framework for Enterprise Agility, Experimentation and Innovation

GLOBAL PRODUCT DATA INTEROPERABILITY SUMMIT 2016

ELYSIUM Parker Aerospace NORTHROP GRUMMAN BOEING

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What you get from this Briefing…

- **DevOps Recap**
- **DevOps and TFS**
- **Demo**

PRESENTATION GOAL: ***To Provide You More Awareness of Emerging IT Trends and What Our Organization is Doing***

Who are these guys?

- **Joe has 20 years in Business and IT with a broad range of architecture, design, development and process improvement experience. He has held various positions supporting Northrop Grumman's internal and external lines of business for the past 10 years. He is currently an IT Program Manager. Prior to joining Northrop Grumman, Joe worked as a software developer, chief systems engineer/integrator to management positions for companies such as Accenture, Deloitte Consulting and various tech start-ups. He is a certified Scrum practitioner and has a BA in History from UCSD and a Master's degree from UCSD's School of Global Policy and Strategy.**

- **David is a Developer with Northrop Grumman Corporation (NGC) and has been with the company for one year. Prior to working for Northrop Grumman he worked at HP for ten years with a variety of roles including, Operations Support, Team Lead, Engineer, and a Developer. David has a Bachelor of Science (BS) in Information System Security (ISS), a Master of Science (MS) in Software Engineering, and is in process of obtaining a Doctorate of Computer Science (DCS) in Information Assurance.**

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DevOps Recap

DevOps Definitions…

DevOps is a software development method that stresses communication, collaboration and integration between software developers and Information Technology(IT) professionals. DevOps is a response to the interdependence of software development and IT operations. It aims to help an organization rapidly produce software products and services.

Wikipedia

"DevOps, helping to finish what Agile started"

Bi-line for http://devops.com

"DevOps is, in many ways, an umbrella concept [introduced in 2009] that refers to anything that smoothes out the interaction between development and operations"

Damon Edwards, http://dev2ops.org/2010/02/what-is-devops/

Problem Statement Bottom-Line

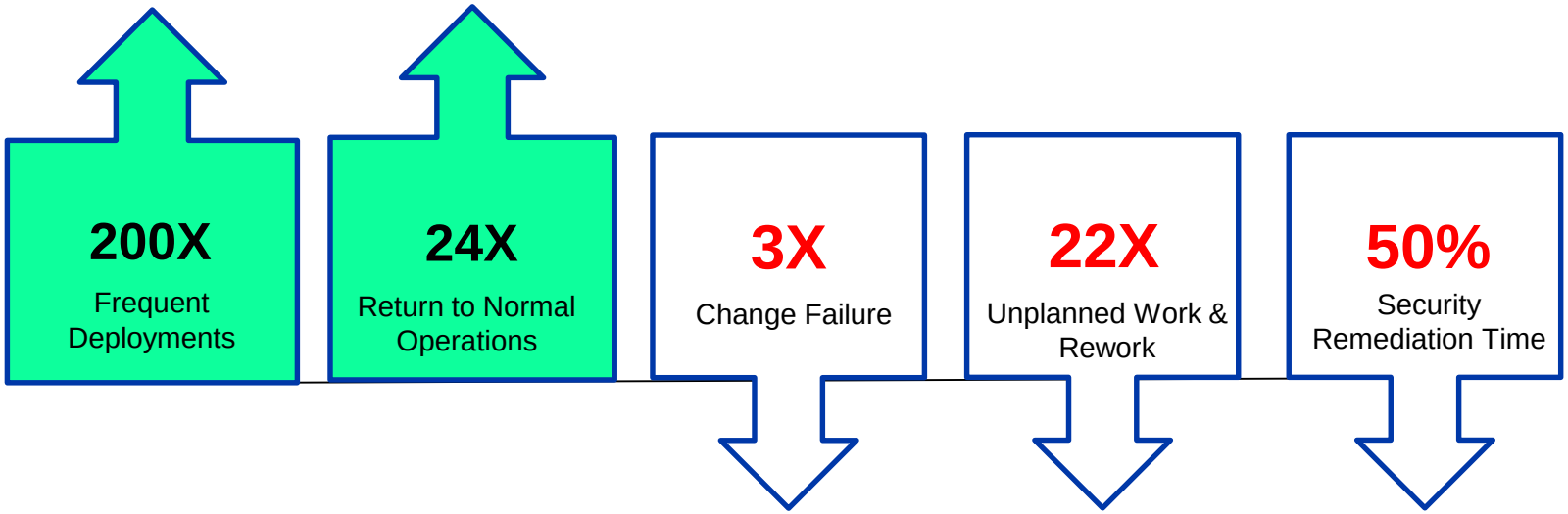
Source: W. Pullen, The Value of Application Delivery & DevOps

Solution: A Different Way of Thinking and Operating…

- Collaborative, Dev and Ops teams combine or working closely together
- Continuous improvement across the deployment pipeline targeted at producing something of value to a user or organization
- Feedback-driven, shared insight into architectural health and performance measures at each stage and end-to-end

The Pay-off

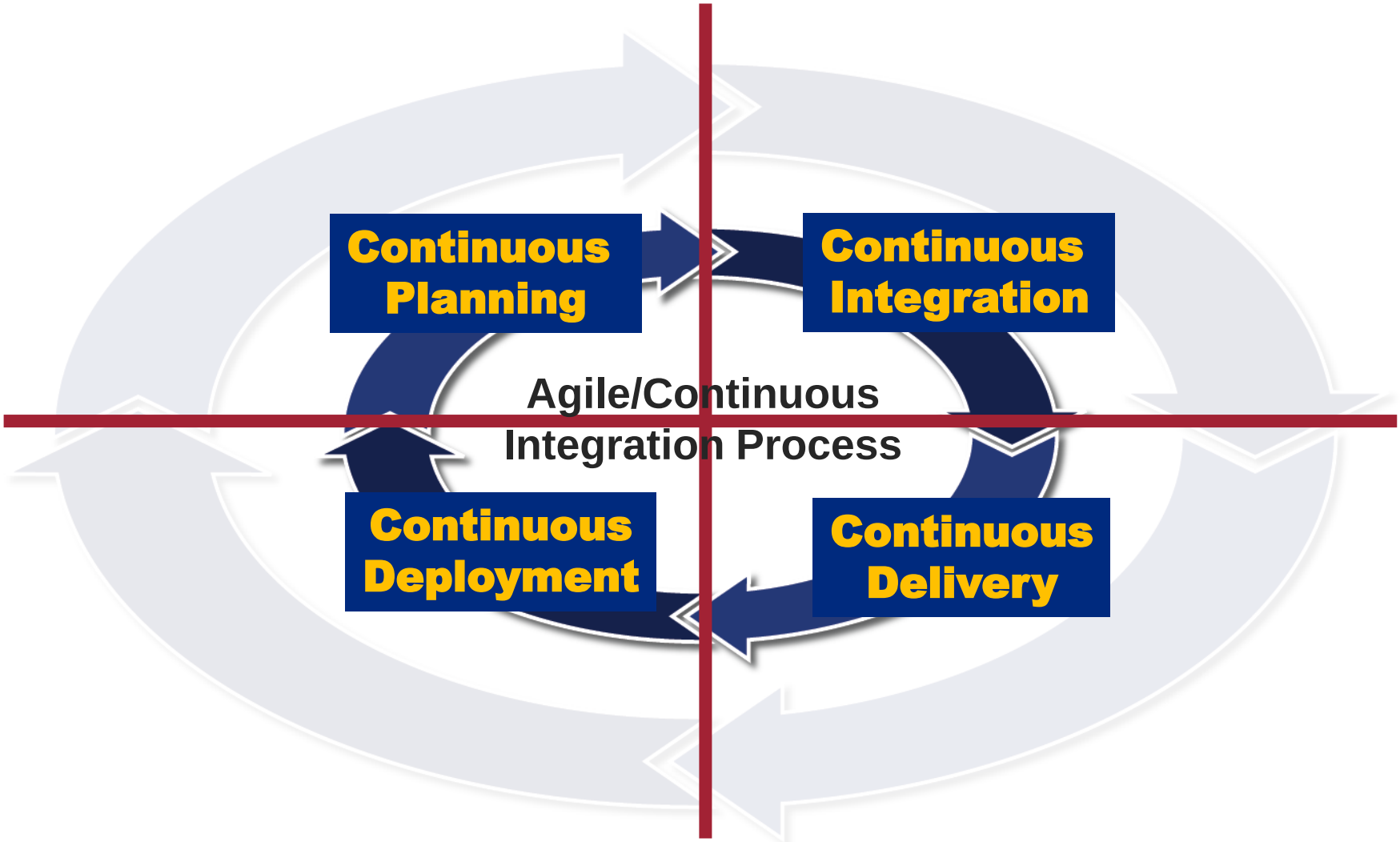
- Based on a 2016 Puppet Labs study Highly effective DevOps organizations have the following impact on the business



Source: 2016 State of DevOps Report, Puppet Labs

High performing teams offer secure and reliable products, services and capabilities quicker, faster

DevOps Lifecycle



DevOps Lifecycle Activities Example

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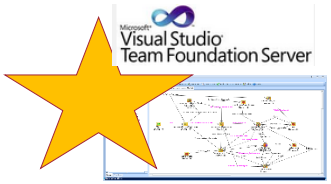
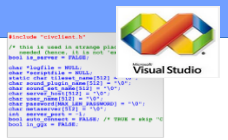


(1a) Defects – Existing Releases

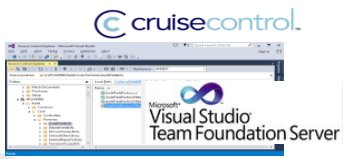
(1b) Enhancements & Defects – New Release

(2) Dev Team



(3) Source Code

(4) Version Control



(5) Source Code Label/Build

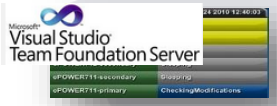
(15) Build Notification Emailed

Continuous Planning

Continuous Integration

(6) Static Code Analysis

Agile/Continuous Integration Process



(14) Update Build Results/Artifacts

Continuous Deployment

Continuous Delivery

(7) Setup Test Databases

(13) Update Build Dashboard

(12) Deploy to Test Cluster

(11) Create CD Installation

(10) Create SDK Documentation

(9) Code Coverage Analysis

(8) Run Automated Tests

DevOps Systems Thinking: Patterns and Practices

PEOPLE

- Autonomous Teams
- Integrated Teams
- Joint Meetings
- Job Rotations
- End-to-End SDLC Engineers

PROCESS

- Minimum Viable Product
- Automated Builds
- Small Batches
- Automated Testing/Test Everything
- Continuous Delivery/Release Automation
- Canary Roll-Outs
- Chaos Monkey

Netflix: Randomly terminates a running service in a group to see how well the system tolerates the failure

CULTURE

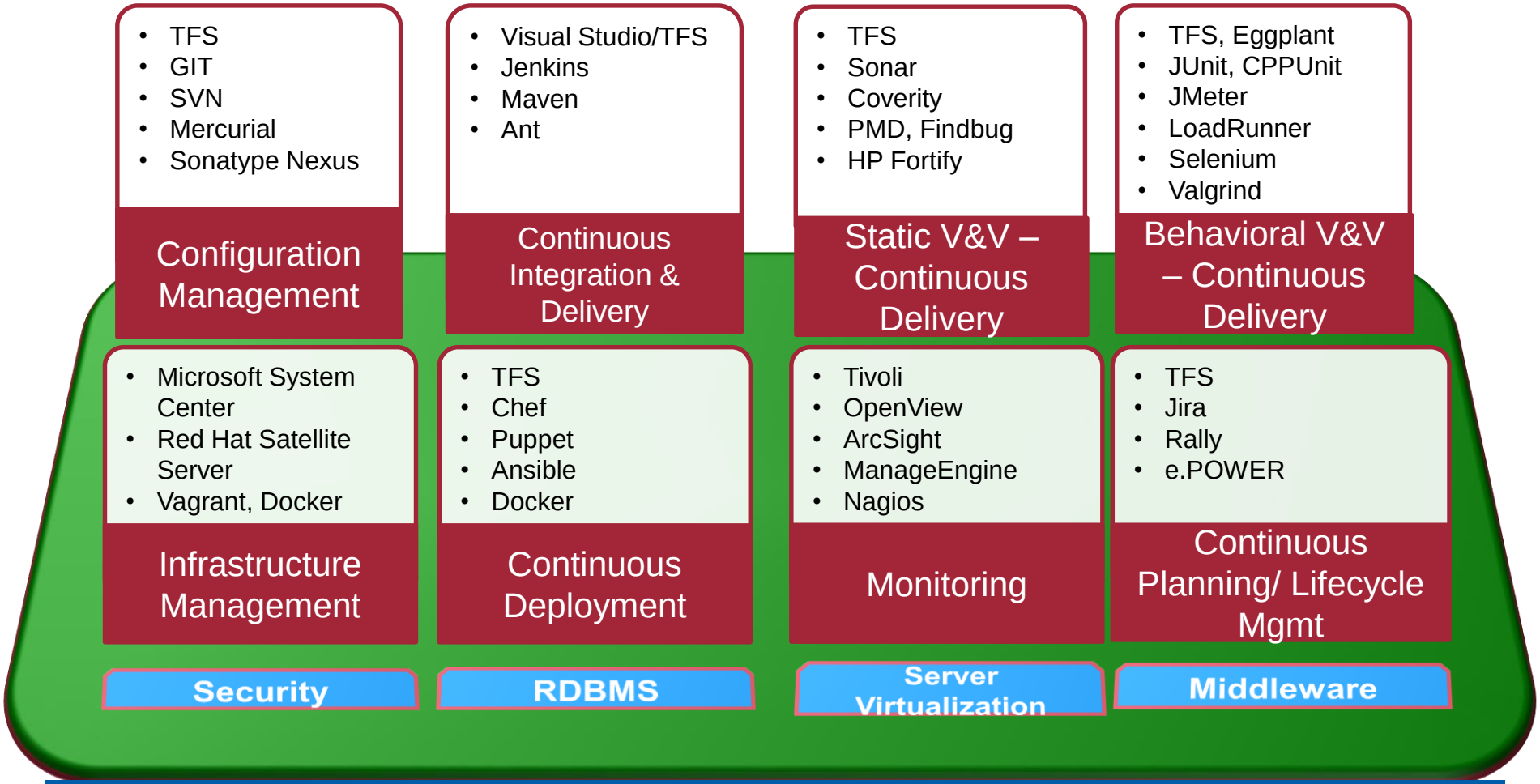
- Collective Ownership
- Collaborative
- Continuous Experimentation
- Hackathons

TECHNOLOGY

- Developer Self-Service
- Infrastructure as Code
- Platform as a service
- Continuous Monitoring/Monitor Everything
- Integrated ecosystems

Multi-dimensional Perspective Required To Be Effective

DevOps Technical Reference Model



Beware: Tools rapidly emerging and evolving as DevOps matures

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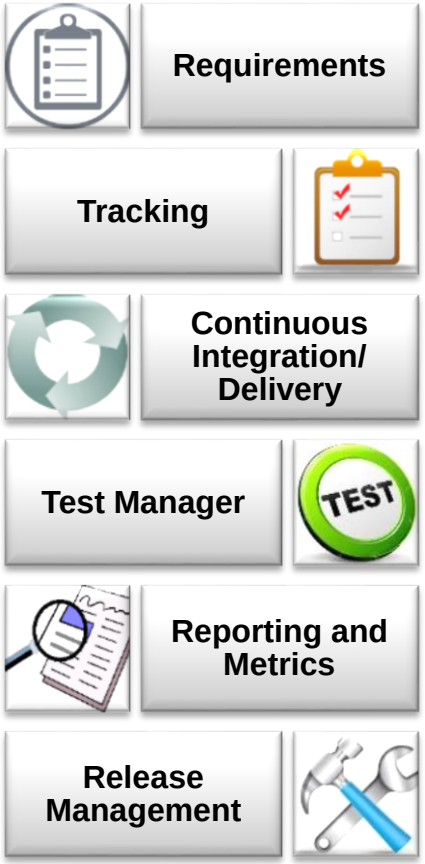
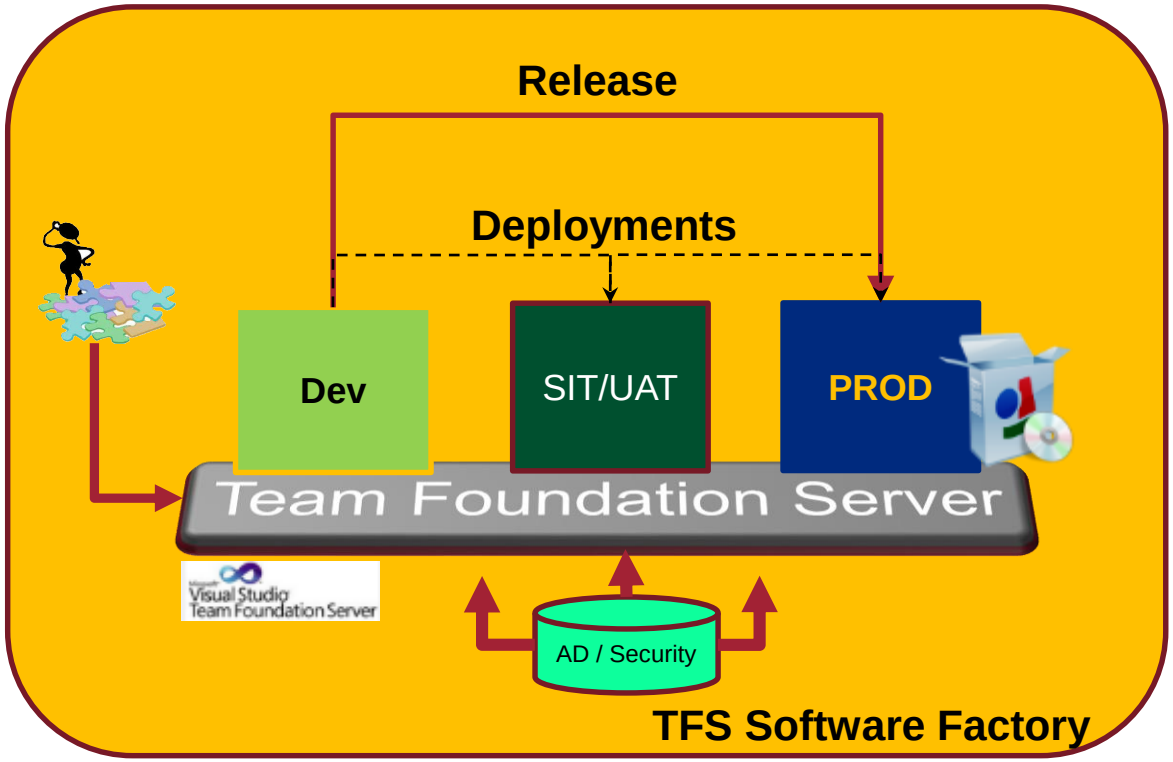
DevOps and TFS

Team Foundation Server (TFS)





A platform for integrating, collaborating, experimenting and deploying software products Better, Cheaper, Faster

Team Foundation Server (TFS) Capabilities

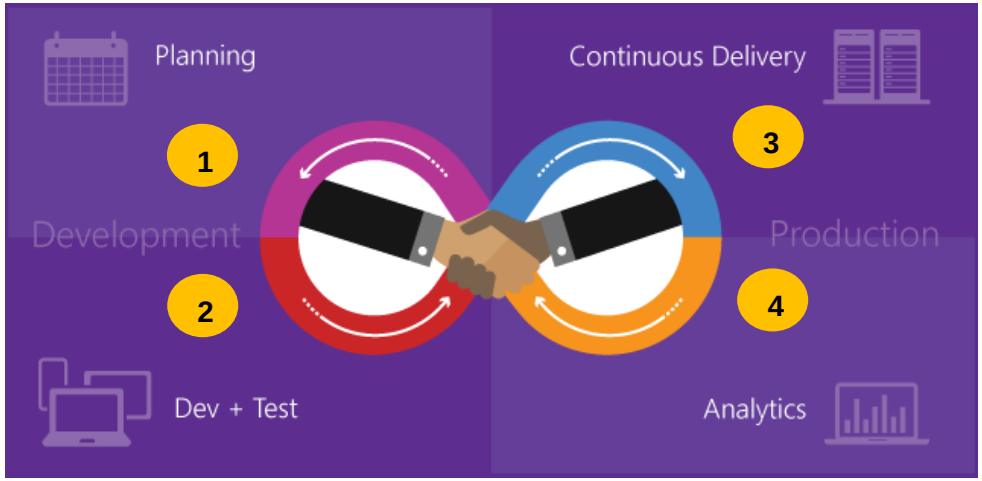
Source: DevOps and Application Lifecycle Management, Microsoft Corporation, https://www.visualstudio.com/en-us/docs/vsts-tfs-overview

Project Start-up
Collaboration Site
Requirements Gathering

Source Control
Continuous Integration

Release Management

Configuration Management



Code Check-in
Microsoft Test Manager /
3rd Party Test Software

Reporting

MS Office Integration

Incubated organically and growing within Northrop Grumman

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Demo

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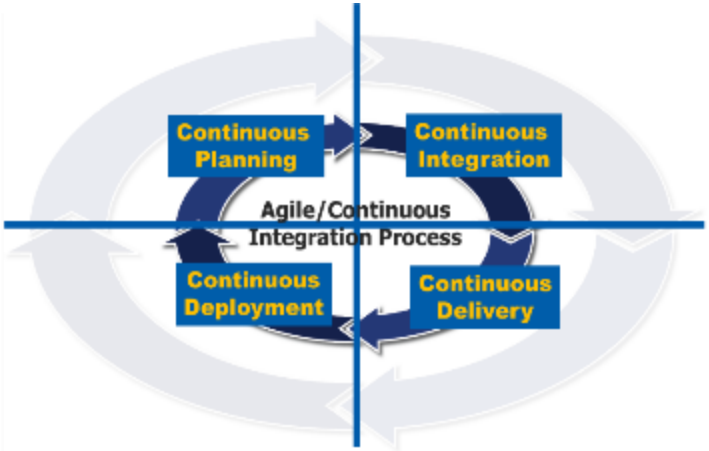
Summary

On the path to DevOps

- **Continuous Planning**
  - **Agile Project/Portfolio Management Tools**
- **Continuous Integration**
  - **Development activity**
  - **Integrate and test software often using automated version control & management tools**
  - **Early feedback to developers**
- **Continuous Delivery**
  - **Continuous Integration+**
  - **Deliver working software to next phase**
    - **QA and V&V**
    - **Security Testing**
- **Continuous Deployment**
  - **Continuous Delivery+**
  - **Deploy integrated and tested product to production**
  - **Monitoring and Incident Management Tools**



- ***TFS as an enabler for future work within Northrop Grumman***

Graphics and References

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- **The Seven Habits Of Highly Effective DevOps,** Forrester Research, https://www.forrester.com/report/The+Seven+Habits+Of+Highly+Effective+DevOps/-/E-RES93781
- **The Value of Application Delivery & DevOps**, 12/10/15 by Wesley Pullen, Electric Cloud