



SSW-555: Agile Methods for Software Development

Scaled Agile Framework (SAFe)

Dr. Richard Ens
Software Engineering
School of Systems and Enterprises





Acknowledgements

Some of the material in these slides is from
"The Big Picture of Enterprise Agility" by Dean Leffingwell,
Scaling Software Agility Blog, 2009

<http://scalingsoftwareagilityblog.com/wp-content/uploads/2009/11/the-big-picture-of-enterprise-agilitywhitepaper.pdf>

Today's topics

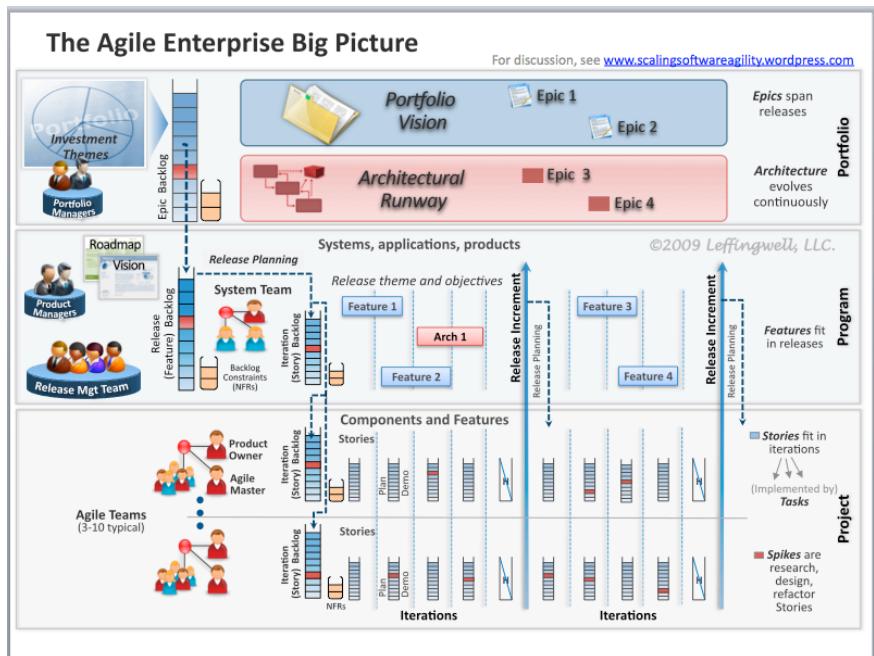
Scaling Agile and Scrum to larger projects

Overview of SAFe

Project Level of SAFe

Program Level of SAFe

Portfolio Level of SAFe



Limitations of Scrum for large projects

Small teams

Self-directed teams – don't wait for instructions from the boss

Rely on face-to-face communication

Only short-term planning

No Big Design Up Front (BDUF)

FDD recommends JEDI

Isolated projects

Single Product Owner (Customer)

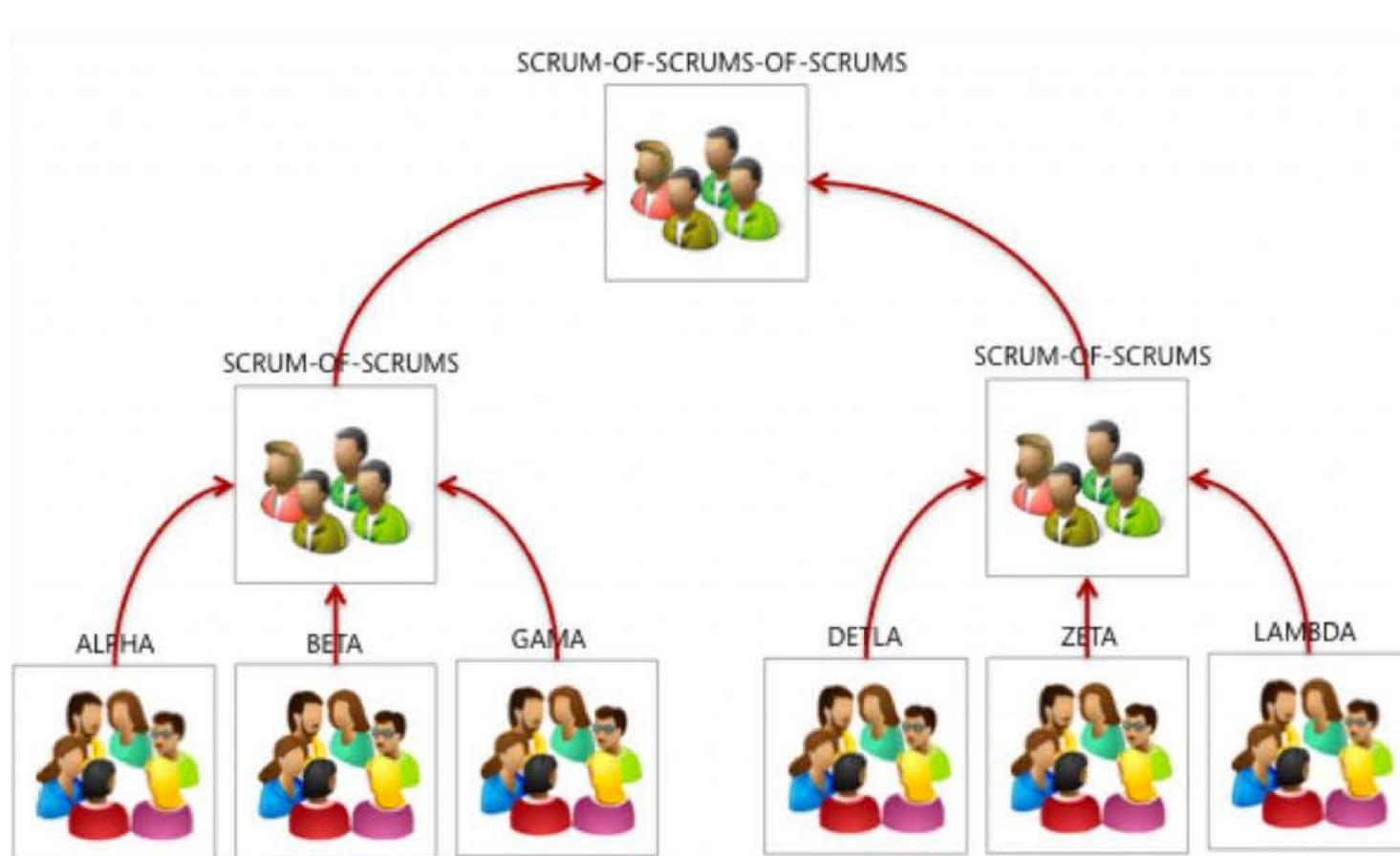
Answers developers' questions

Sets priorities and release dates



Scrum of Scrums: One solution

Scrum of scrums provides one technique to scale Scrum to larger projects

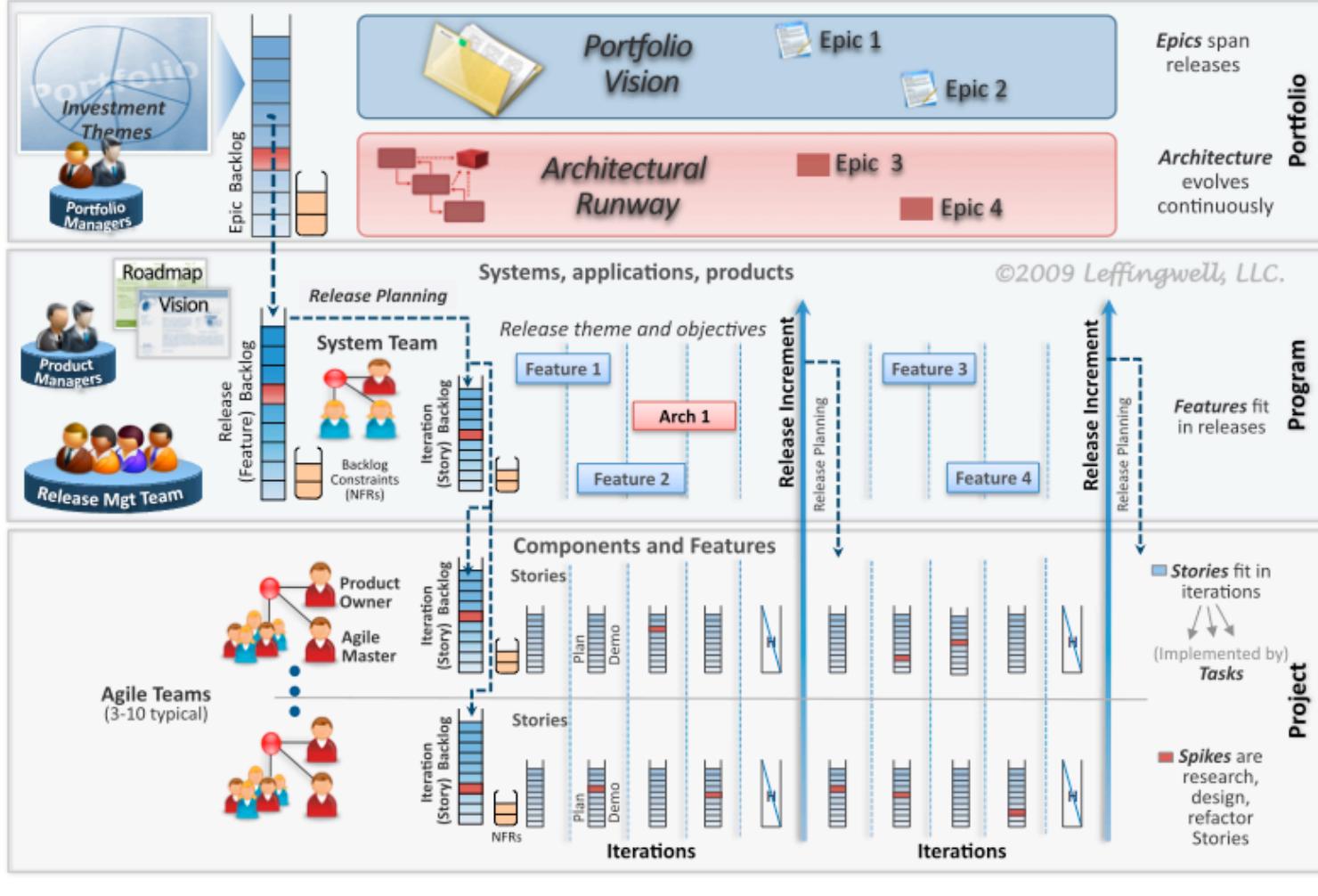


Source: Scrum of Scrums: Running Agile on Large Projects by Leandro Faria, Scrum Alliance, 5 June 2013
<https://www.scrumalliance.org/community/articles/2013/june/scrum-of-scrums-running-agile-on-large-projects>

Overview of SAFe

The Agile Enterprise Big Picture

For discussion, see www.scalingsoftwareagility.wordpress.com

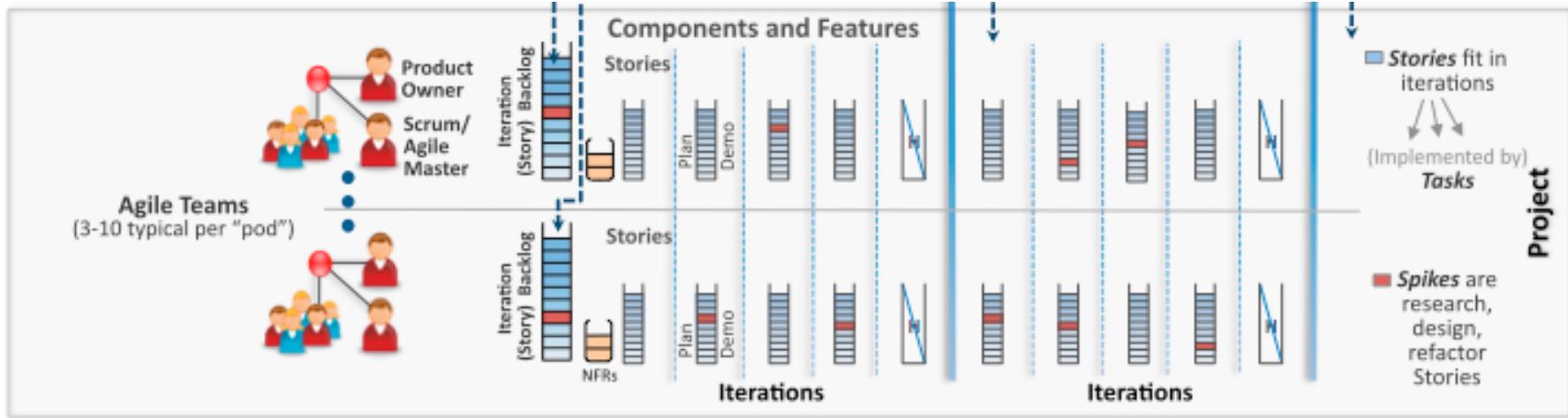




Three levels of organization

Level	Role	Title	Requirements
Portfolio	Long-term planning	Portfolio Manager	Epics
Program	Large system management	Product Manager	Features
Project	Traditional Scrum teams	Product Owner	User Stories

Project Level of SAFe



Agile teams define, implement, and test user stories

Use Lean, Scrum and/or Kanban

Deliver components or features

Small enterprises may have a few teams

Larger enterprises may have "pods" of teams

Project Level: Agile Teams

5-9 people

Organized around a single component or feature

Define – user stories

Build

Test

May do acceptance testing

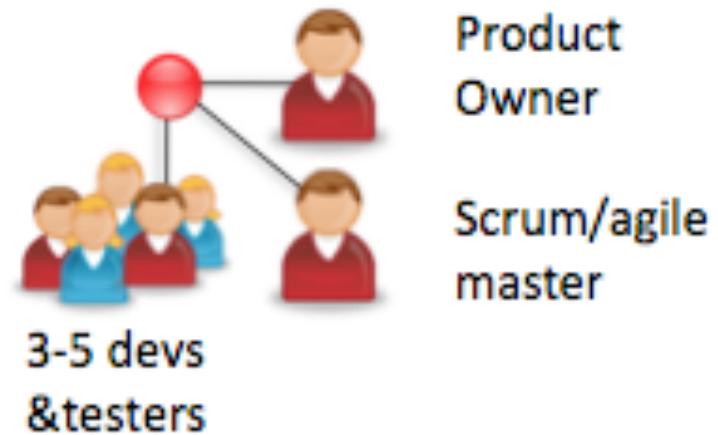
May be supported by specialists:

Architects

Technical writers

Build support staff

Internal IT



Project Level: Pods of Agile Teams

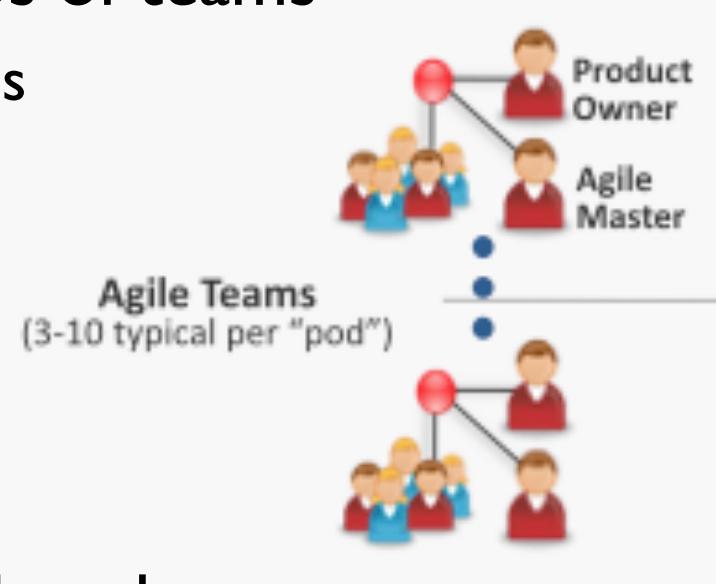
Larger systems may require groups of teams

Deliver features, systems/subsystems

May have 3-10 teams cooperating
with one another

Result is 50-100 people
collaborating face-to-face

Each team primarily works alone but the
other teams are readily available for
collaboration



Project Level: Roles on Agile Teams

Product Owner

Determine and prioritize requirements

Maintain Product Backlog

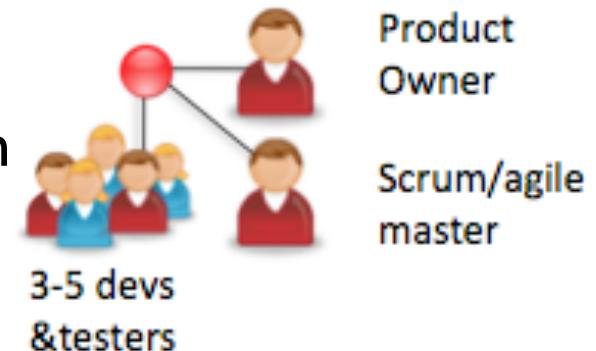
Collocated with the team for daily interaction

Scrum/Agile Master

Trains and coaches team in use of Scrum

Acts as "management/leadership proxy"

Product management role



Developer

Define, build, test and deliver software

May include "full or part-time architects, tech leads, user experience and documentation experts"

Project Level: Iterations (Sprints)

Standard time-boxed intervals

Iteration length is same for all teams

Typically 2-4 weeks

Need to integrate modules across teams

Features may slip to meet time-boxed intervals

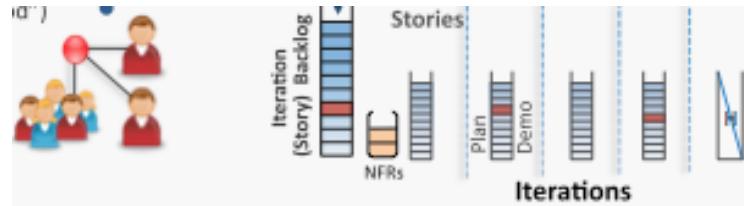
Must meet quality goals

Each release contains:

4-5 development iterations/sprints

1 "hardening" iteration – resolve integration problems, etc.

Fully shippable increment every 90 days or so



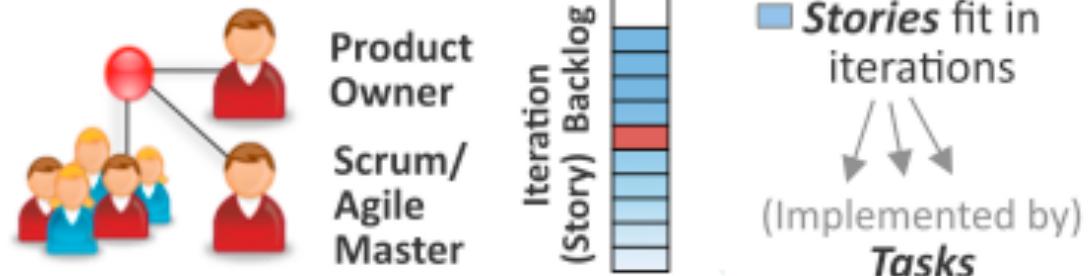
Project Level: User stories and tasks in the backlog

Each team has its own Iteration Backlog:

User stories

Defects

Refactoring



Stories may be decomposed into Tasks for estimation and tracking

Project Level: Agile Release Train

Multiple Agile teams delivering functionality

Time boxed iterations with quality requirements

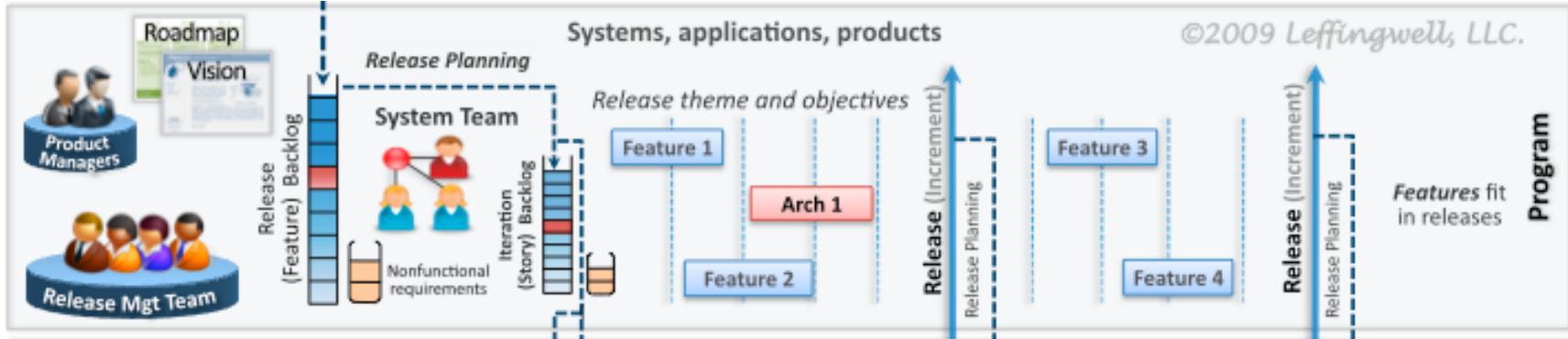
Features in each release may change to meet the schedule

Deliveries are made every time the train “enters the station”



<http://digitalspirit.dbsystel.de/en/how-the-agile-release-train-is-moving-freight-forward/>

Program Level of SAFe



Release Management and Product Managers

System team and Release management team

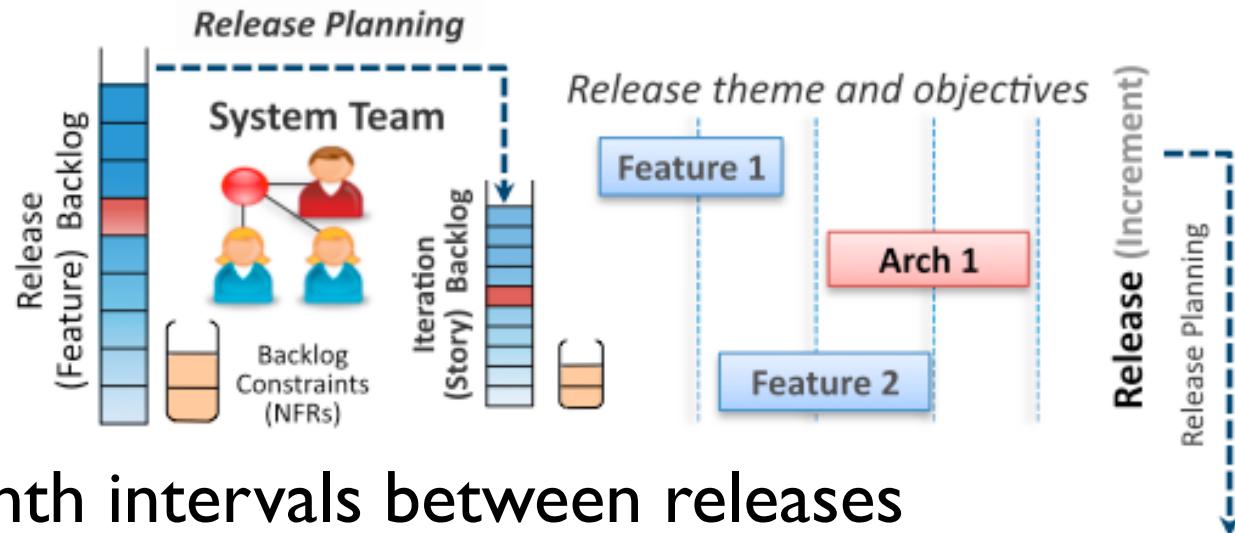
System level testing and release evaluation

Coordinate work of Agile Teams in the Project Level

Understand how the work should evolve over time

Program Level: Releases

Each iteration produces a "potentially shippable increment"



Typically 2-4 month intervals between releases

Recall that the Agile teams are using 2 week sprints

May not want to release every increment to customers:

- Defects, refactoring to remove technical debt

- May interfere with customer's licensing and service agreements

- Potential disruption to customer

Program Level: Vision and features

Product Managers
are responsible for
overall Vision



The Vision answers:

What problem does this solve?

What features and benefits does it provide?

For whom does it provide it?

What performance, reliability, etc. does it deliver?

What platforms, standards, etc. will it support?

Technical and marketing issues

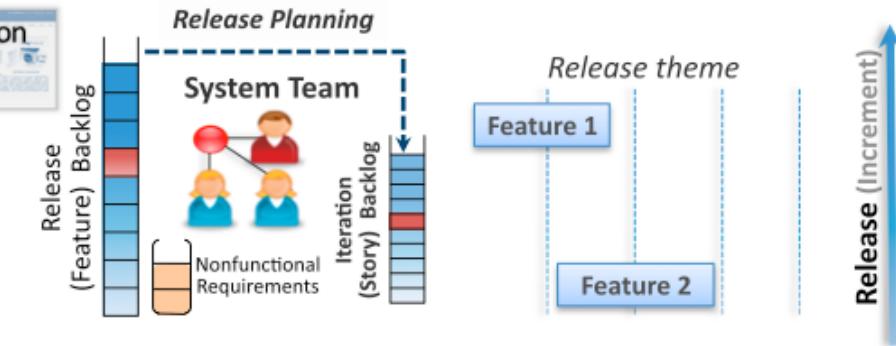
Release Backlog consists of prioritized features

Features later refined into stories

Release Backlog contains all desired features that haven't been delivered yet

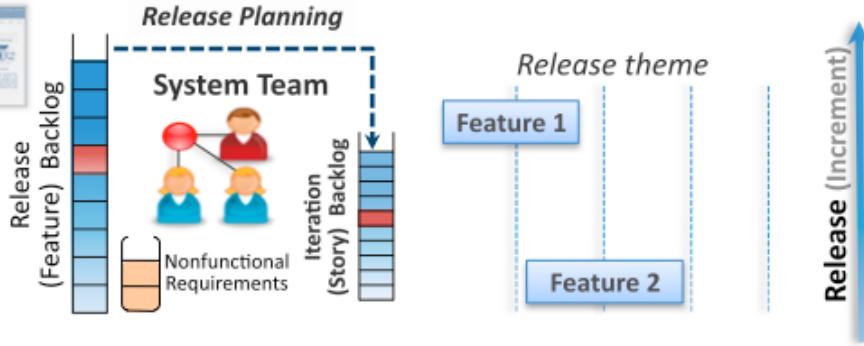
Specify non-functional requirements: “*ilities”

Scalability, reliability, compatibility, security, ...



Program Level: Release planning

Product Managers
are responsible for
Release Planning



Analogous to Sprint Planning

Identify time box with typically multiple sprints

Hold Release Planning meeting

Use vision and business objectives to identify prioritized list of features to include in next release

Create a **Roadmap** to describe the “plan of intent”

Program Level: The Roadmap

Release planning breaks features into stories

Stories assigned to teams

Interdependencies are identified and addressed

Result is a Roadmap:

Planned release dates

Each release includes:

Theme

Objectives

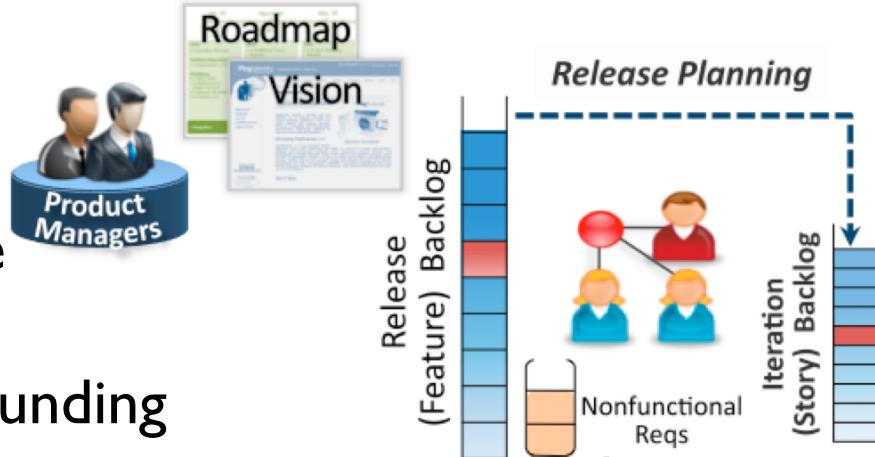
Set of features



Program Level: Product Management

Scrum Product Owners:

- Represent the interests of everyone with a stake in the resulting project
- Achieve initial and ongoing funding
- Create initial requirements, return on investment objectives and release plans



SAFe Product Managers responsibilities are more broad:

- Define the product
- Position the solution in the market

Portfolio Level of SAFe



Portfolio Managers responsibilities:

- Manage enterprise investments
- Manage enterprise resources

Investment themes

Epics

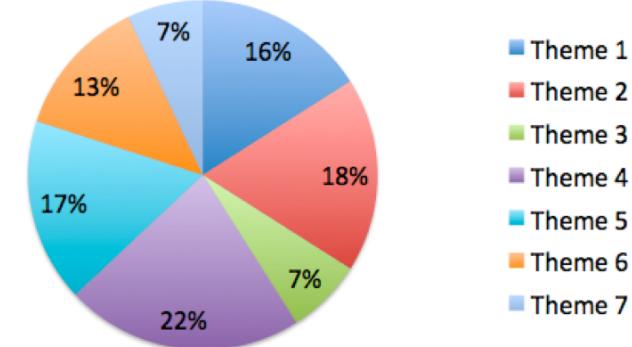
Portfolio Level: Investment Themes

Large enterprises make decisions once or twice per year on investment themes:

- Existing offerings (enhancements, support and maintenance)
- New offerings
- Futures – require investment now, but will not contribute toward revenue until later
- Sunset – end support for existing products and services

Themes: how should the enterprise allocate financial and other resources?

2H2009 Investment Themes



Portfolio Level: Investment Themes

Themes identify key value propositions

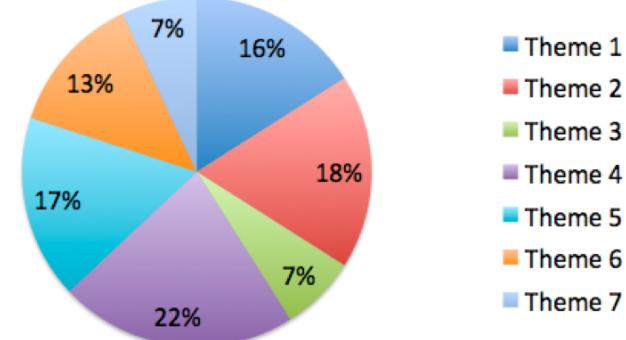
Differentiate the company's products

Provide competitive advantage

Themes are allocated a percentage
of total working time

Themes may span multiple years

2H2009 Investment Themes



Portfolio Level: Epics, Features, Stories, Tasks

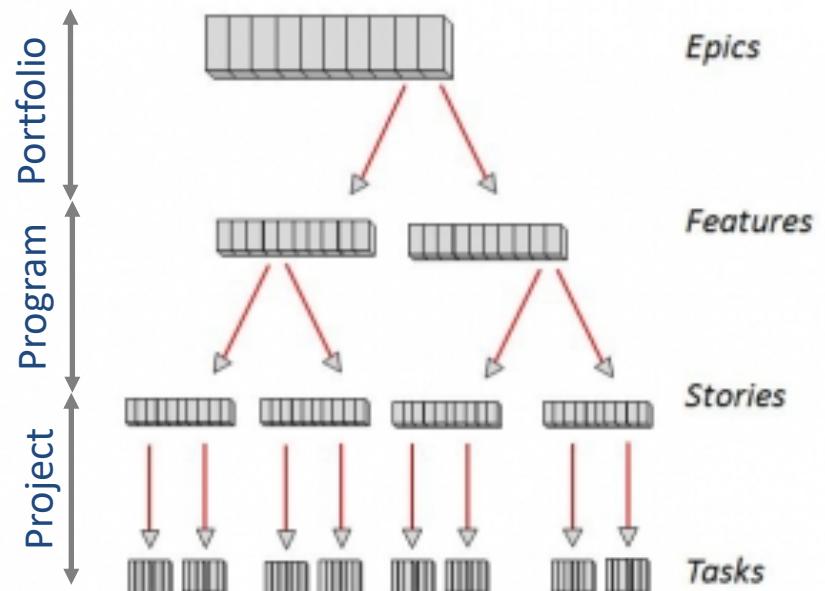
Themes are later defined as Epics
in the Portfolio Backlog

Epics describe strategic intent

Epics are further refined into
Features

Features are broken into Stories

Stories are broken into Tasks

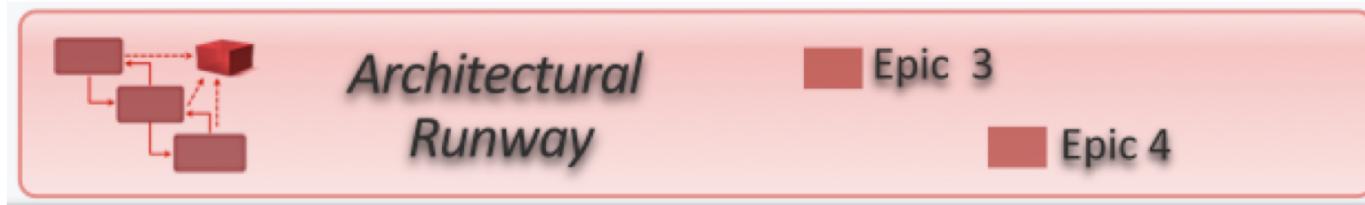




Three levels of backlogs

Level	Backlog	Contents
Portfolio	Portfolio backlog	Backlog of prioritized epics describing strategic intent
Program	Release/product backlog	Backlog of prioritized features
Project	Iteration backlog	Backlog of user stories aligned to business needs

Portfolio Level: Architectural Runway



"A system with architectural runway has existing or planned infrastructure sufficient to allow incorporation for current and near term requirements without excessive refactoring." - Leffingwell

Failure to maintain architectural runway may lead to:

- Missed release dates due to large-scale refactoring
- Slowed velocity
- Inability to create new features

Portfolio Level: Architectural Runway

Architectural Runway spans all three levels

Portfolio

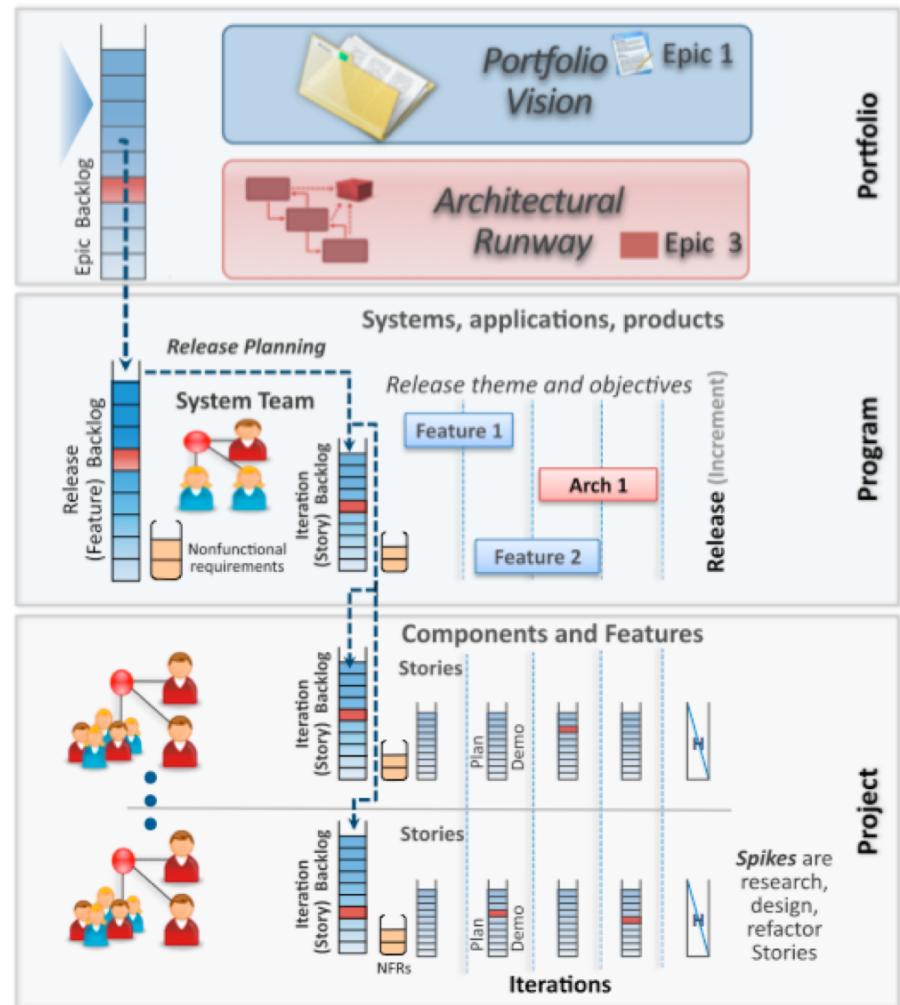
Infrastructure initiatives
Architectural epics

Program

Architectural features for releases

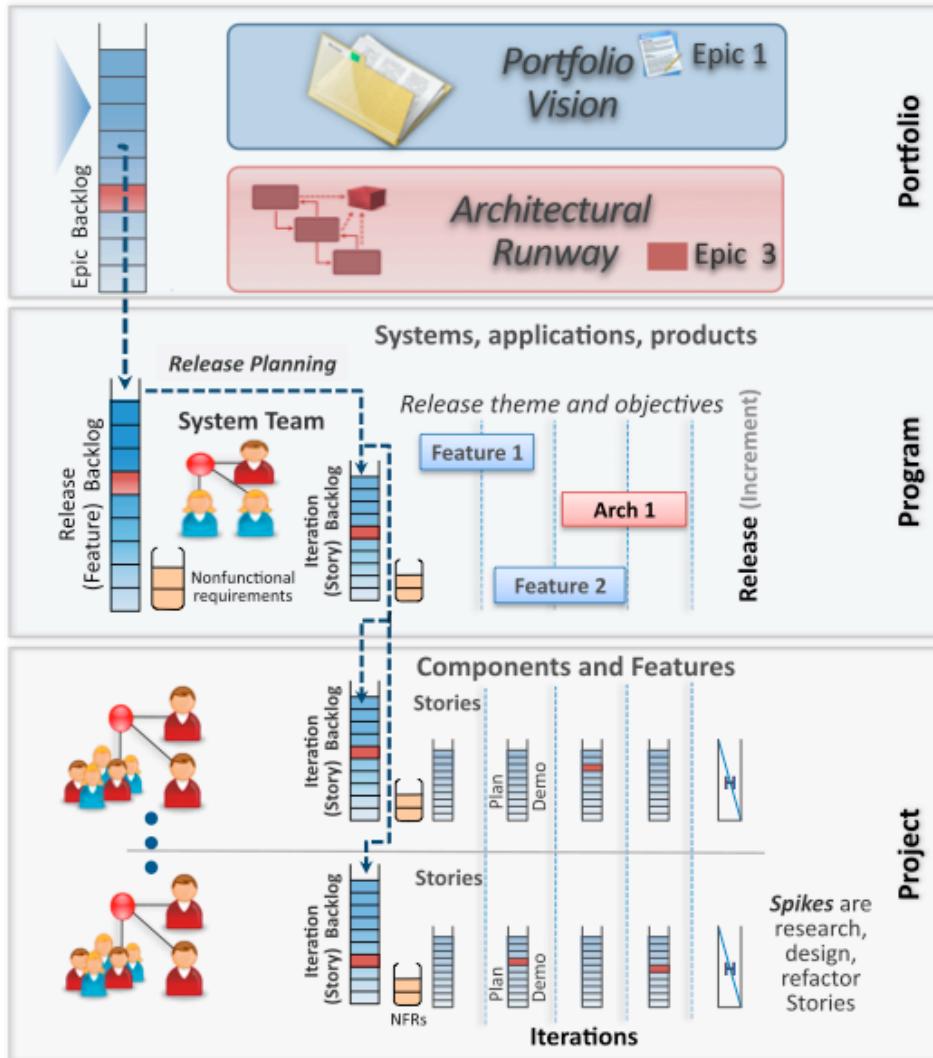
Project

User stories



Source: The Big Picture of Enterprise Agility (Rev. 2)

SAFe Summary

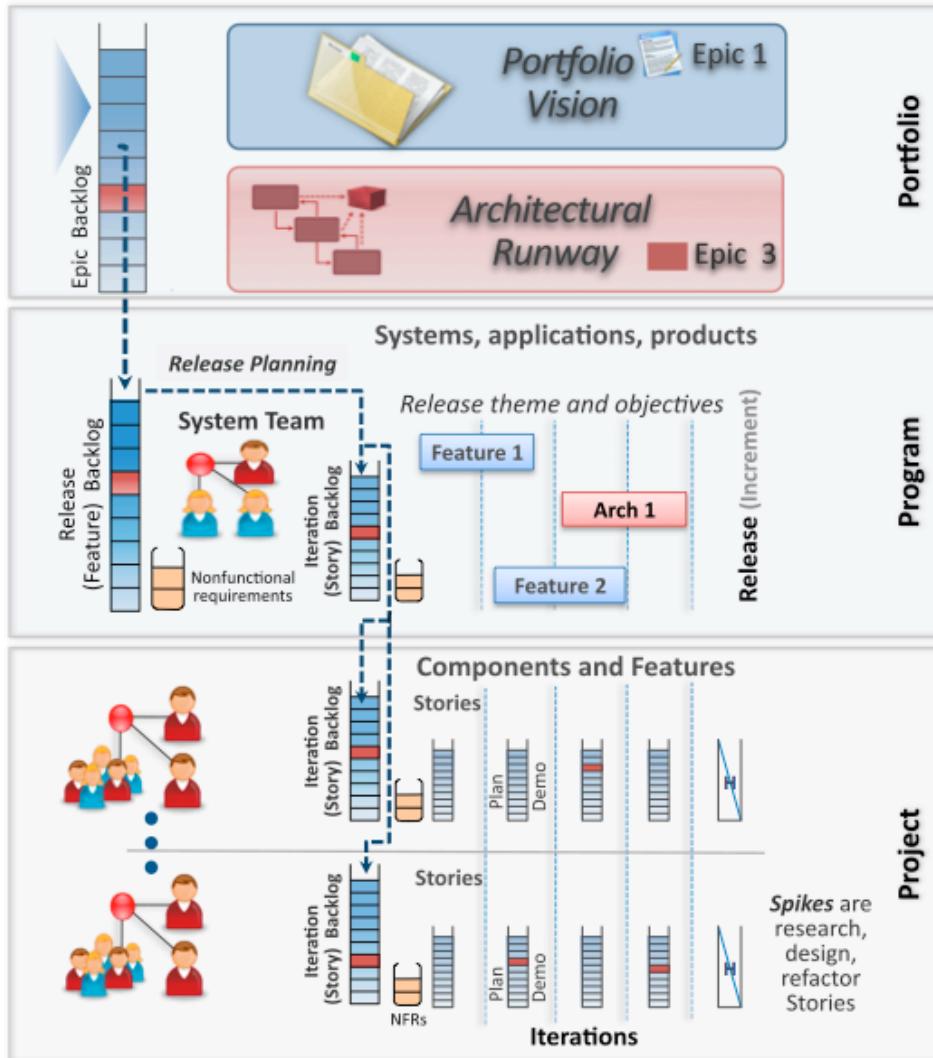


Resource investment vision
Overall architecture of one or many products

Manage a large organization
Focus on releases to meet customer needs

Traditional Scrum/Kanban teams
Optional pods

SAFe Summary



Executives



Portfolio

Middle managers



Program

Developers, testers



Project

Questions?

