



Producing the Software that Runs the Most Powerful Machines in the World

The Inside Story on Cray Software Test and Release

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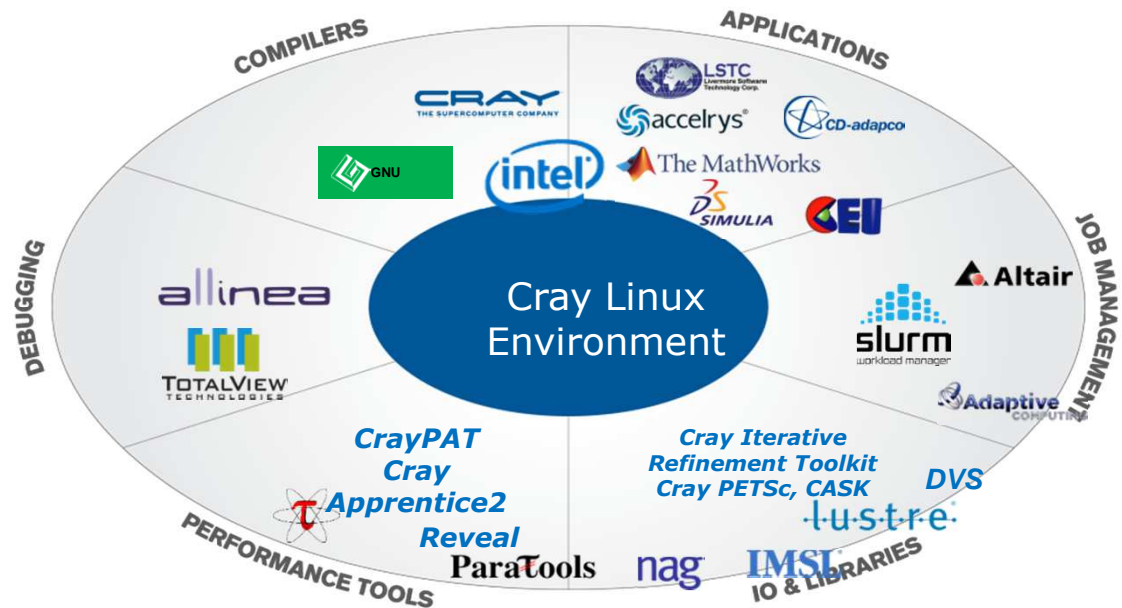


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Cray Software Guiding Principles

- Performance is a key metric of our Market
- Differentiate when strategically sound
- Follow industry standard solutions where they exist
- Collaborate with customers and the community
- Focus on quality in the areas of
 - Timely software releases
 - Updates with no regressions



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Outline

- Types of testing
- Release Model
- Release Timeline and Activities
- Challenges
 - Reliability Runs
 - Machine Management
 - Scale Testing



Types of Testing

Feature Testing -> Functional testing of new features

Regression Testing -> Extensive, automated tests

Stress Testing -> Heavy load, various aspects of operation

Scale Testing -> Testing at large node count

Stack Testing -> Functional testing; third party components

Performance Testing -> Stability of performance levels

Reliability Testing -> Extended load, system stability

Exposure Testing -> User community; usability

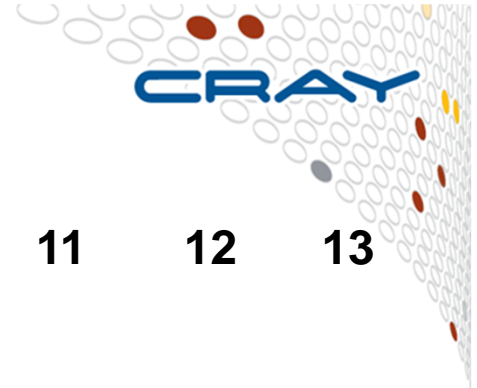


Release Model

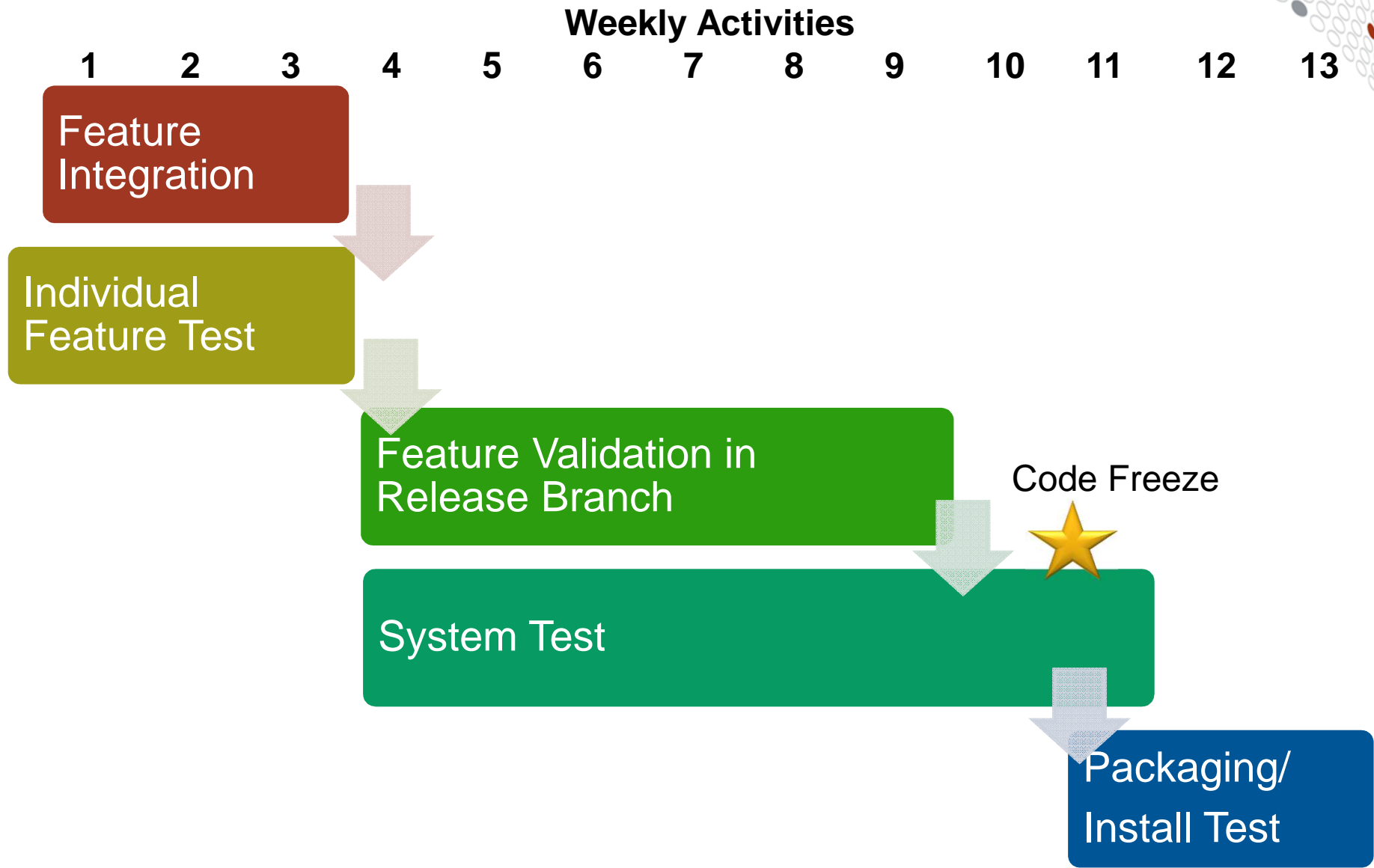
Train Model

- Releases occur at scheduled intervals
- Features are mapped to releases
- Features can be moved out to later releases
- Protecting the base functionality





Release Timeline and Activities



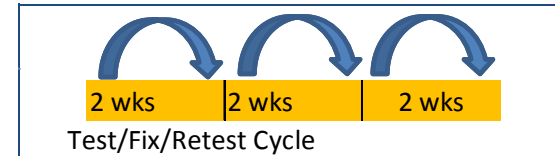
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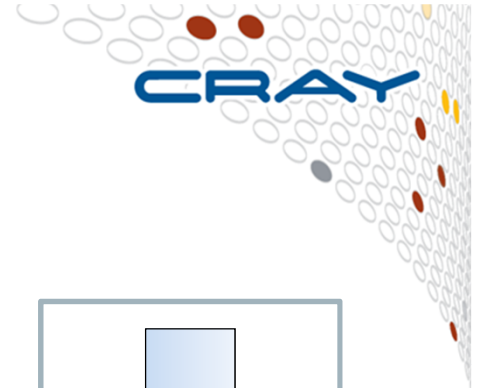


Reliability Runs

- Sustained load; extended period
- System stability
- Run multiple times



Release Criteria Description	Release Criteria	Attempted For This Run	Actual
RelRun Level (Describes load, mix and size. See below for description)	15	15	12
Longest System Uptime	48	48	32.7
Compute Node Loss	0.68 compute nodes/cabinet/day	Same as release criteria	6.04 ¹
System Interrupts	0	0	1
Service Node Loss	0	0	0



Machine Management

DEV machines

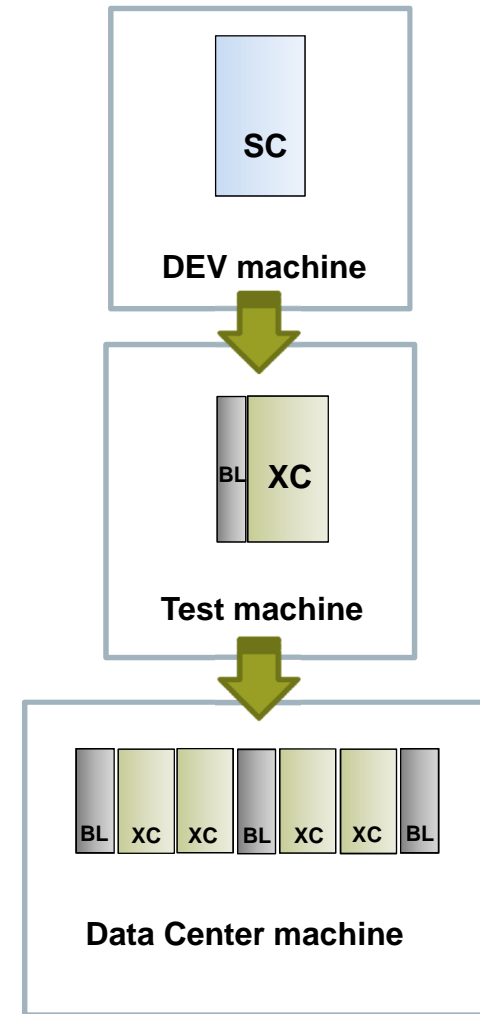
- Multiple small node count machines
- Some special configurations, generally separate
- Updated daily/weekly with DEV branch

Test machines

- Larger node count machines
- Fully featured configurations
- Updated weekly with release-in-progress

Data Center

- Largest machines
- Independently managed and shared with larger Cray user community
- Updated weekly with release-in-progress; delayed from test machine exposure



Scale Testing



Primary areas of concern

- Functionality at scale
- Rare occurrence issues

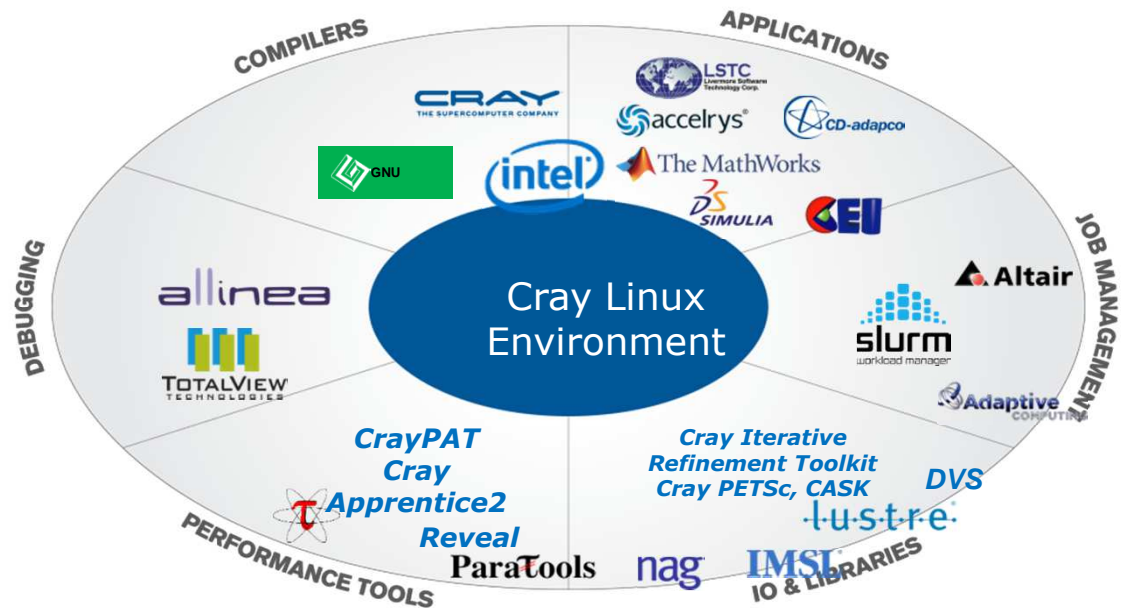
Key strategies

- Simulation
- In-house stress testing
- Engineering testing on machines during manufacturing
- Customer partnerships



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