eclipse CON 2005

the eclipse way

processes that adapt

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Eclipse Project Management Committee Members
IBM

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outline

- on the way to 3.1
- the Eclipse way

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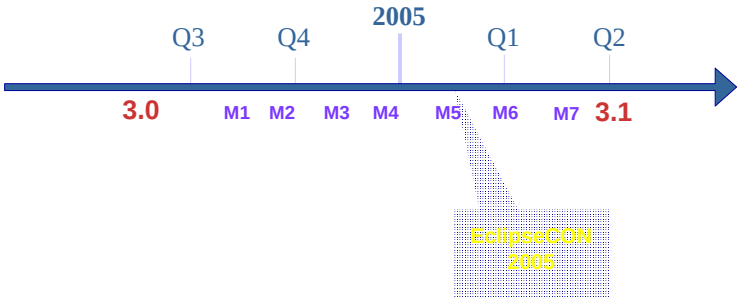
on the way to 3.1…



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3.1 themes

- scaling up
- enterprise ready
- design for extensibility: be a better platform
- simple to use
- rich client platform improvements
- J2SE 5 support
- broadening the community

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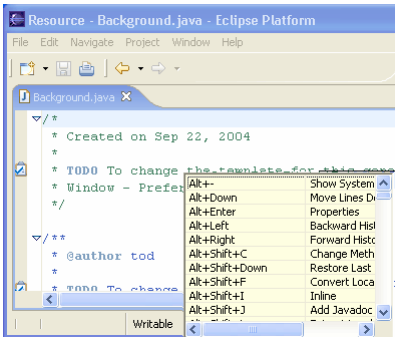
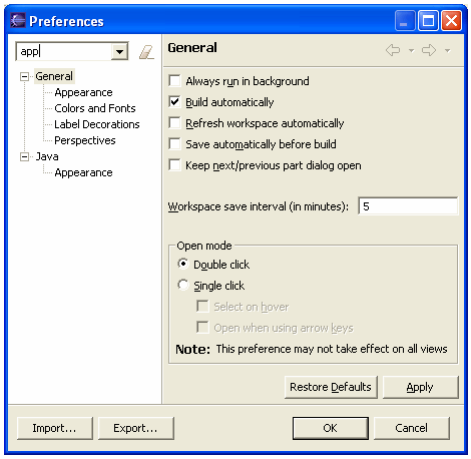
UI





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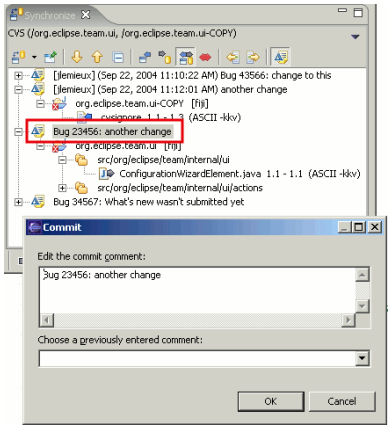
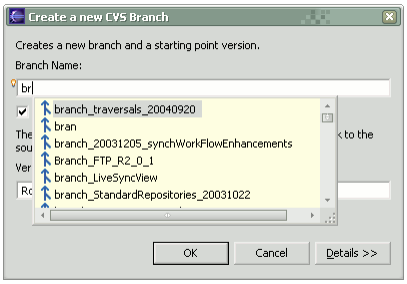
CVS





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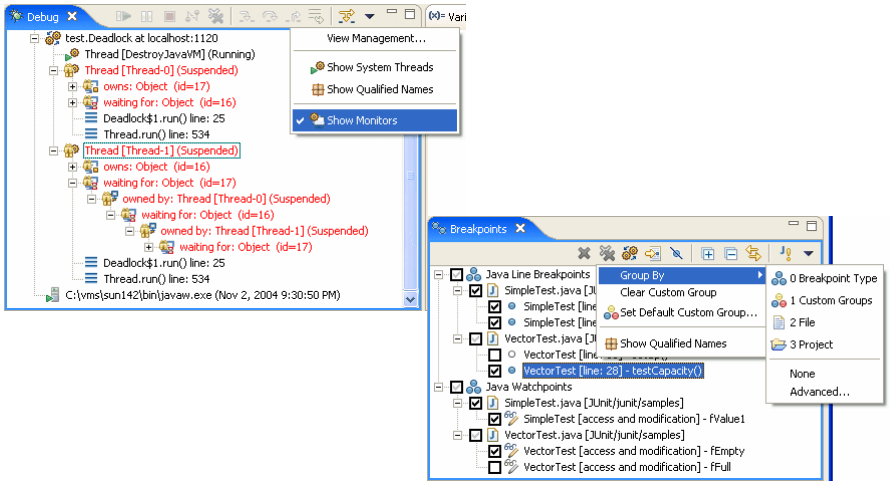
Debug



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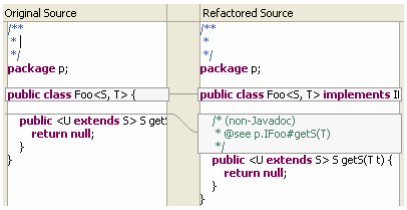
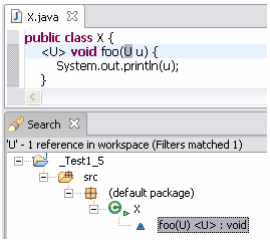
J2SE 5

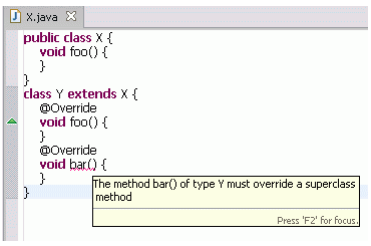



```
enum TestStyle { CORRECTNESS, PERFORMANCE }

@Target(METHOD)
@interface Test {
    TestStyle style() default CORRECTNESS;
}

@Test(style=PERFORMANCE)
public void randomAccess() {
    List<E> vector= fFull;
    long before= System.currentTimeMillis();
    E one= vector.get(42);
    long after= System.currentTimeMillis();
    Long maxAccessTime= new Long(100);
    assertTrue(after - before < maxAccessTime);
}
```





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JDT Quick Fixes

```
public void conditionsCheck(boolean a, boolean b) {
    if ((!a) && b) {
    }
}
```

- Add else block
- Inverse conditions
- Remove extra parenthesis
- Split && condition

```
...
public void conditionsCheck(boolean a, boolean b) {
if ((a) || !b) {
//then-block
...
```

```
if (element instanceof IAdaptable) {
```

- Introduce new local with casted type

```
public void conditionsCheck(boolean a, boolean b) {
    if (a || b) {
        //then
    } else {
        //else
    }
```

- Inverse 'if' statement
- Rename in file

```
...
public void conditionsCheck(boolean a, boolean b
if (! a && ! b) {
//else-block
} else {
//then-block
}
...
```

```
String[] names= {"Calvin", "Hobbes"};
for (int i= 0; i < names.length; i++) {
    String name= names[i];
    System.out.println(name);
}
```

- Convert to enhanced for loop
- Remove surrounding 'for' statement

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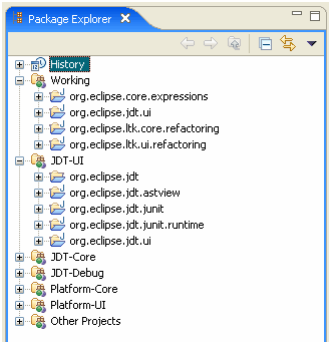
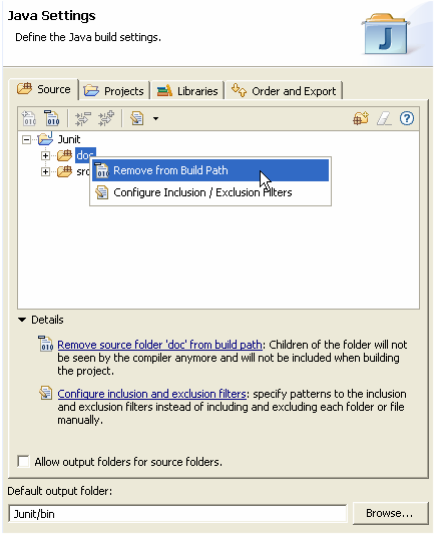
JDT UI





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JDT NLS support

```
alid_range=Invalid range argument
alid_visible_region_1=Invalidx visible region argument
```

Change to 'Invalid'
Change to 'Invalids'
Always ignore 'Invalidx'
Add 'Invalidx' to dictionary

```
String s;
s= Messages.getString("test");
s= Messages.getString("t
s= Messages.getString("t
s= Messages.getString("s
```

Externalized Value:
Hello World
Press 'F2' for focus.

```
TextViewer.error.bad_location.shift_2= TextViewer.shif
TextViewer.error.bad_location.verifyText= TextViewer.v
TextViewer.error.invalid_range= Invalid range argument
TextViewer.error.invalid_visible_region_1= Invalid vis
TextViewer.error.invalid_visible_region_2= Invalid vis
```


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Ant

```
<target name="init">
    <echo>start</echo>
</target>

<!-- ================================
     target: base
     ================================ -->
<target name="default" depends="init" descript
    <javac srcdir="src"
     destdir="bin"
     classpath="test.jar"
```

Debug
test build.xml [Ant Build]
c:\Documents and Settings\luc\Desktop\target\test\build.xml
Thread [Ant Build] (Suspended (breakpoint at line 4 in build.xml))
build: echo line: 4
C:\Program Files\Java\jre1.5.0\bin\javaw.exe (Dec 14, 2004 10:53:11 PM)

build.xml

```
<project default="build">
  <target name="build">
    <echo>begin</echo>
    <echo>end</echo>
  </target>
</project>
```

```
<target name="default" depends="init" description="-
    <javac srcdir="src"
     destdir="bin"
     classpath="tes
     debug="on"
  />
  </target>

</project>
```

Javac Task - Microsoft Internet Explore
File Edit View Favorites Tools Help
Address http://ant.apache.org/manual/CoreTasl

Javac

Description

Compiles a Java source tree.

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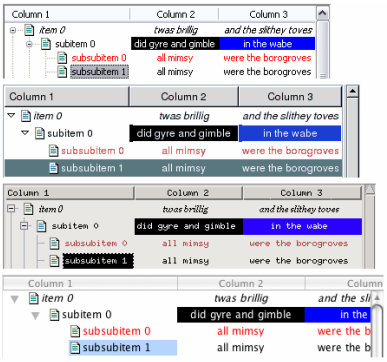
SWT



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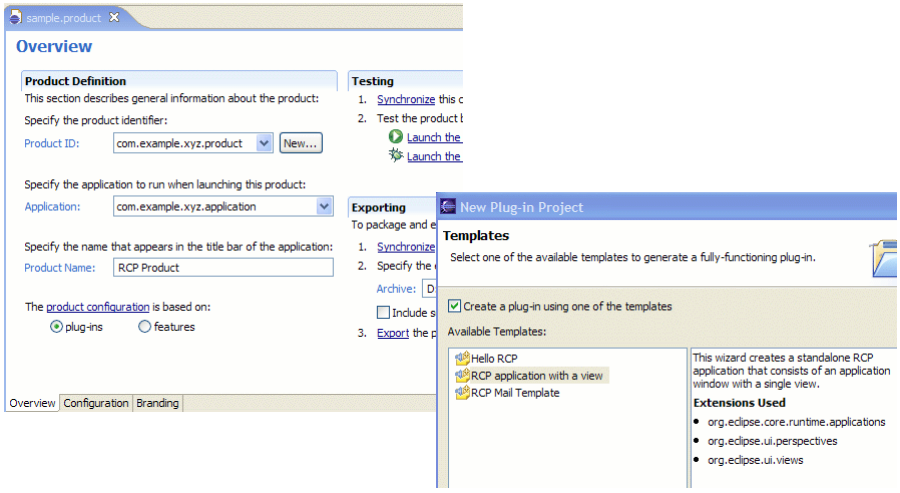
PDE/RCP



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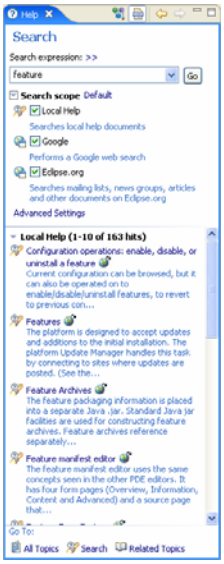
user assistance



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outline

- on the way to 3.1
- the Eclipse way

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why “the eclipse way”?

- our process has evolved over time
  - stay aware, adapt, change
- our process has helped us (the platform) to achieve:
  - predictability
  - quality delivery on time
- share what we have learned
  - influence “by example” – similar as JDT

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“I've been following the development of Eclipse for some time and I'm continually amazed as the extended team hits each projected milestone and ship date with precision. Until this experience, I was convinced that such a feat was impossible for a software project of any size and complexity.

So... the question is how is this really accomplished? And the immediate follow-up of course is, how can this process be replicated elsewhere?

- a post to the eclipse developer’s mailing list

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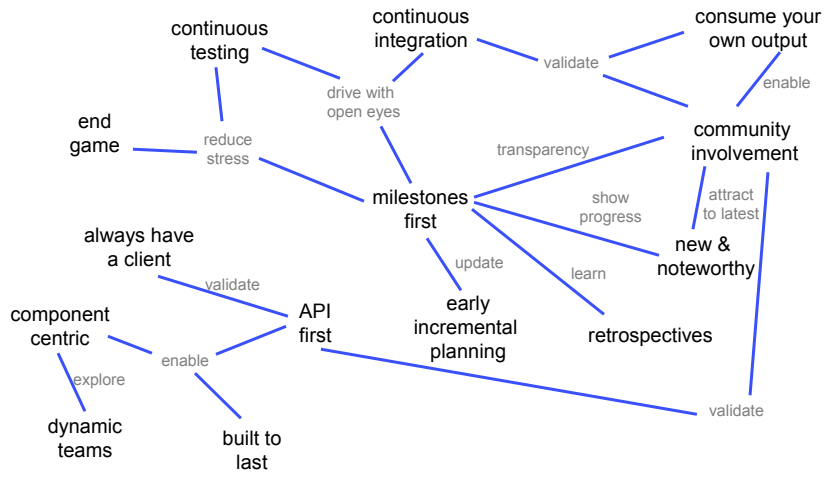
eclipse practices

it's all about feedback!



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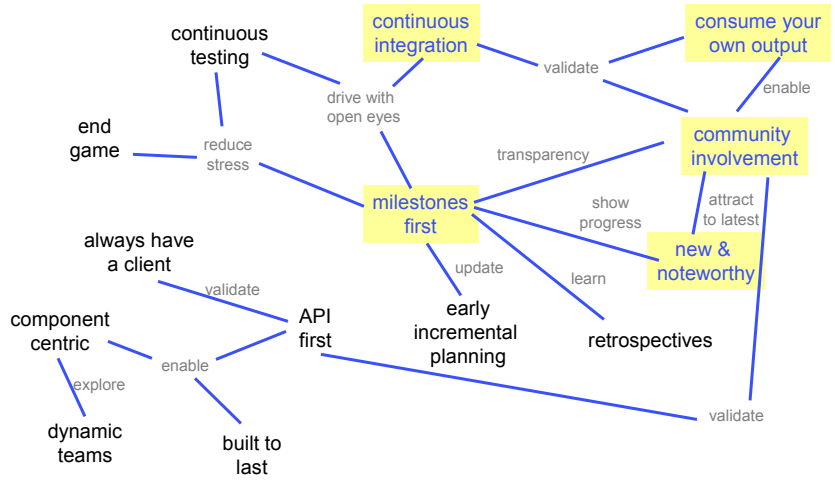
project rhythm



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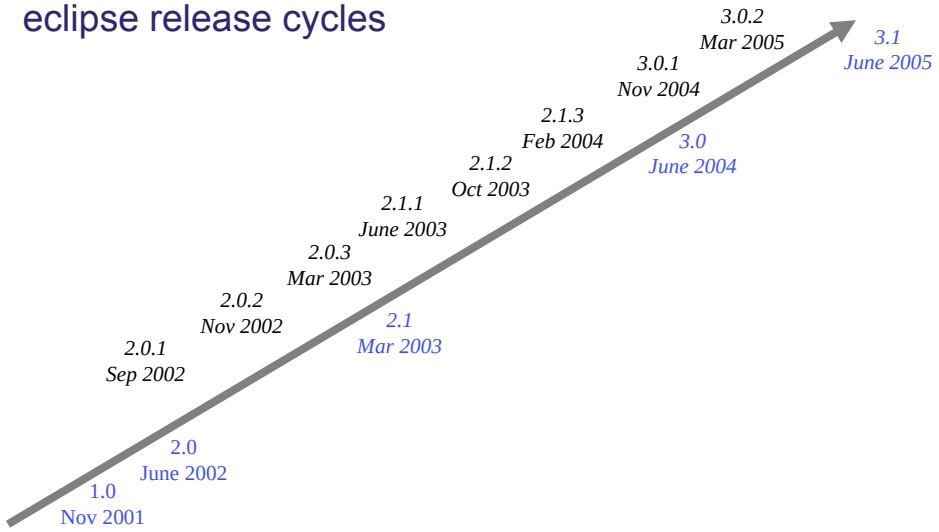
eclipse release cycles



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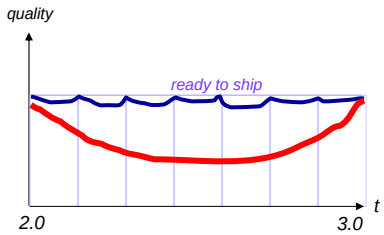
milestones first

- break down release cycle into milestones
  - we currently use 6 weeks
- each milestone is a miniature development cycle
  - plan, execute, test, retrospective
  - teams refer to the release plan when creating milestone plans
    - assign plan items to a milestone
    - milestone plans are public
- result of a milestone
  - milestone builds: good enough to be used by the community
- at the end of each milestone we do a retrospective
  - what went well, what did not?

➢ milestones reduce stress!

- before/after



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continuous integration

- fully automated build process
- build quality verified by automatic unit tests
- staged builds
  - nightly builds
    - discover integration problems between components
  - (weekly) integration builds
    - all automatic unit tests must be successful
    - good enough for our own use
  - milestone builds
    - good enough for the community to use
- reality: build failures occur
  - rebuild to create acceptable integration, milestone builds.

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always beta

- each build is a release candidate; we expect it to work
- results of the build process and the automatic tests
  - indicate where we are
- as tool makers we use our own tools
  - component team – use the latest code daily
  - project team – use integration builds (weekly)
  - community – use milestone builds

➢ continuously *Consume Our Own Output*

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community involvement

- requires transparency
  - community needs to know what is going on to participate
- requires open participation
  - We value the contributions of the community
- we are the community
- *problem*: no one knew what was in a milestone,
  - so there was no incentive to move to milestone builds
  - so we received minimal feedback
    - more stale defect reports
  - quality suffered
- *solution*: publish new and noteworthy
  - advertise what we have been doing

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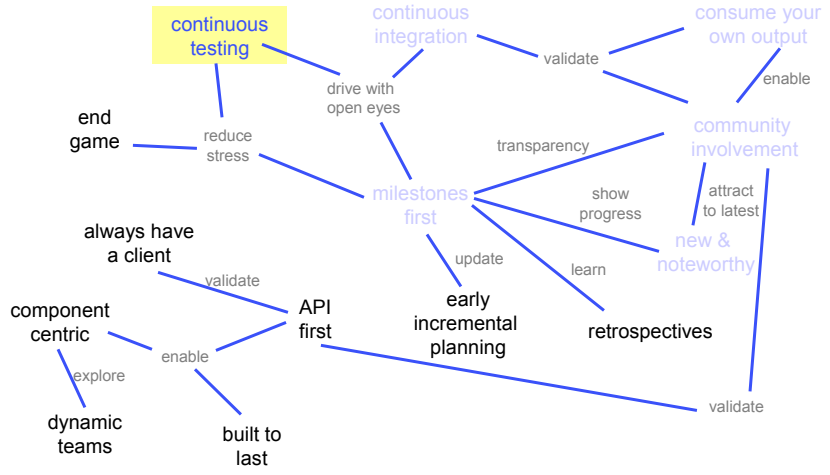
testing



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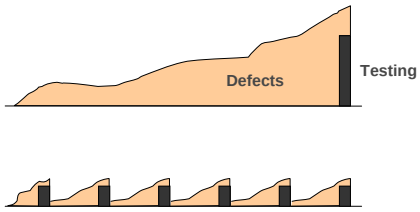
testing

- innovate with confidence
  - continuous incremental design
- > 20,000 JUnit tests
  - tightly integrated into the build process
    - tests run after each build (nightly, integration, milestone)
  - integration builds are only green when all tests pass
- test kinds
  - **correctness** tests
    - assert correct behavior
  - **performance** tests
    - assert no performance regressions
      - based on a database of previous test run measurements
  - **resource** tests, leak tests
    - assert no resource consumption regressions



Kent Beck – JUnit Handbook

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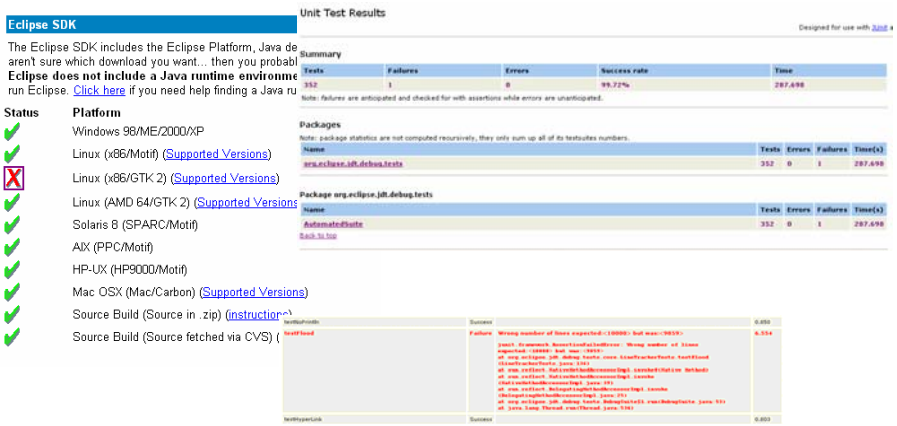
test report



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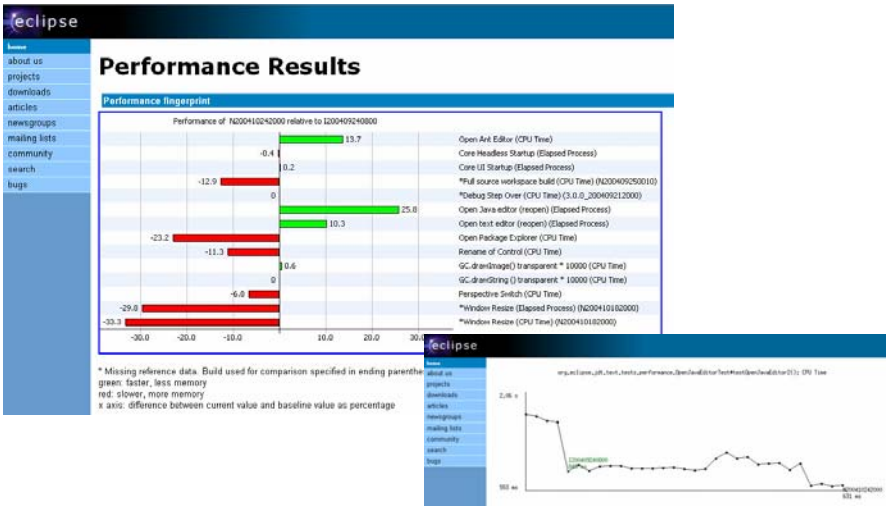
performance test report



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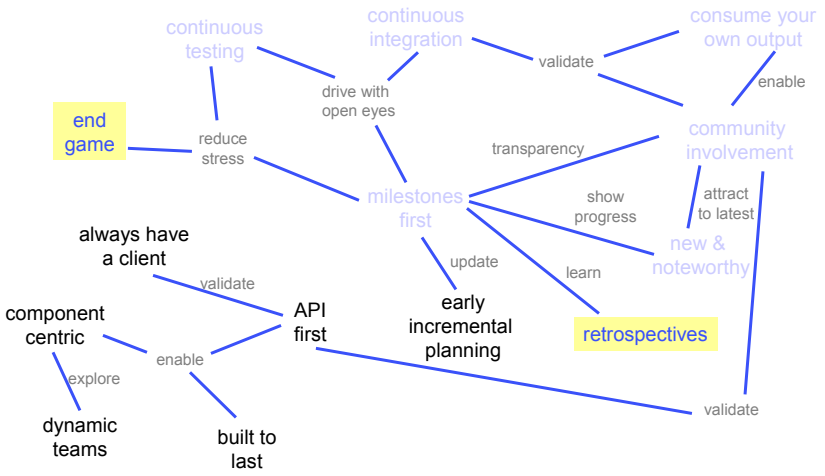
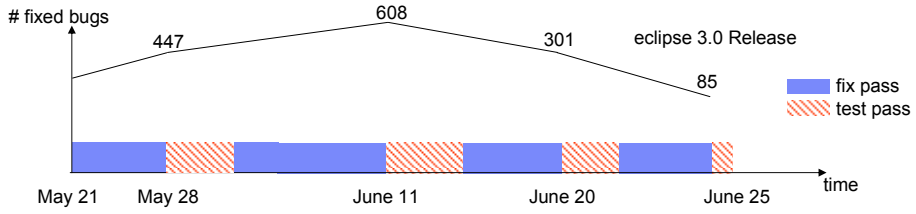
finishing



endgame

- convergence process applied before release
  - sequence of test-fix passes
    - community event
  - with each pass the costs for fixing are increased
    - higher burden to work on fix for a problem
    - higher burden to release a fix for a problem
    - focus on higher priority problems



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endgame

- endgame endurance
  - we are only effective for so long
  - distribute Quality/Polish effort throughout the release
- shared responsibility and commitment
  - we all Sign off

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[platform-releng-dev] PDE status for I-20040625-1208

- "An enthusiastic GO from PDE" - Cherie
- "The best build of the year!" - Dejan
- "An Eclipse build that the whole family can enjoy" - Wassim

- Your PDE team.

decompression

- recover from release
- retrospective of the last cycle
  - achievements
  - failures
  - process
  - cross-team collaboration
- start to plan the next release and cycle

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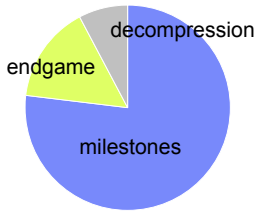
where the time goes

- release cycle 12-16 months
  - milestones - 9 months
  - endgame – 1-2 months
  - decompression – 1 month



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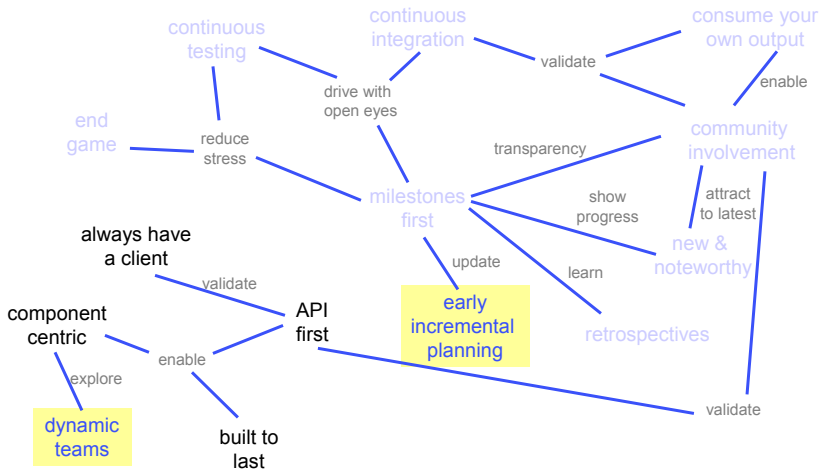
planning



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early planning

- release themes establish big picture
  - community input
  - requirements council new source of input
- component teams define component plans
- PMC collates initial project plan draft
  - tradeoff: requirements vs. available resources
  - Committed, Proposed, Deferred

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the plan is alive

- the project plan is updated quarterly to reflect
  - progress on items
  - new items
  - input from the community
- ➢ becomes final at the end of the release
- before: static plans
  - accurate once, but no early feedback: non-existent until late in the cycle.

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ongoing risk assessment

- address high risk items and items with many dependencies early
- maintain schedule by dropping items (if necessary)
  - we will drop proposed items
  - we hate to drop committed items
  - prefer fewer completed items than more items in progress
- high risk items are sandboxed to reduce risk to other items
  - prefer to serialize highest risk items (to minimize integration pain)

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collective ownership

- PMC meets at least once a week
- all component leads and the PMC meet for a weekly planning call
  - status
  - planning
  - identification of cross-component issues
  - meeting notes posted to the developer mailing lists
- dynamic teams are established for solving cross-component issues
  - one cross-component issue per dynamic team
  - members are key developers from all effected components
  - find, implement, and roll-out solution of the assigned cross component issue
  - represented in the weekly planning calls

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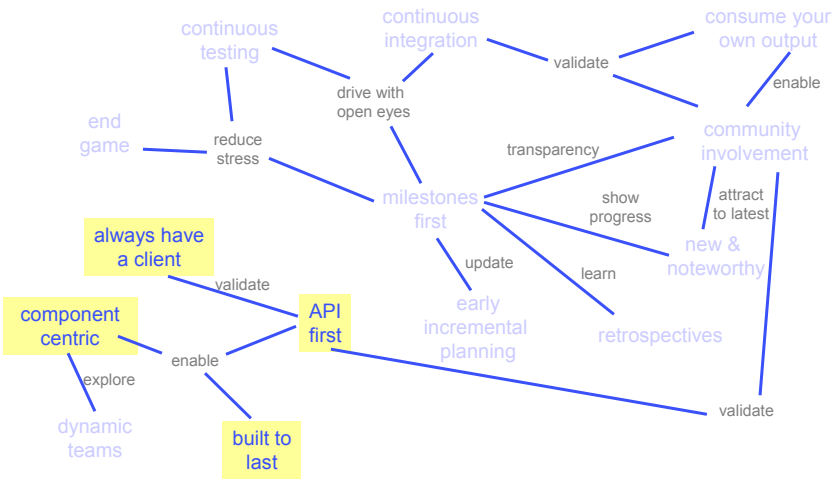
built to last



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built to last

- deliver on time, every time
  - decisions in this release impact what we can do next release
  - must preserve architectural integrity
- deliver quality
  - innovation with continuity
  - need to have a solid foundation
    - scalable
    - performant
    - stable

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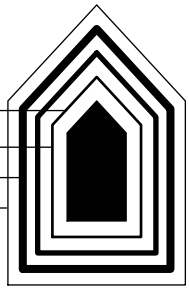
how buildings "survive"

- **Stewart Brand: how buildings learn – what happens after they're built**
  - stuff: furniture
  - services: electrical, plumbing (7-15y)
  - structure: foundation, load bearing walls (30-300y)
  - site: geographical setting (forever)



Site

- **layers:**
  - evolve at different rates during the life of a building
  - shear against each other as they change at different rates
  - an adaptive building must allow slippage
  - ➢ a building that lasts is adaptive and can change over time

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structure foundation

- the eclipse plug-in architecture
- everything is a plug-in
  - simple and consistent

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services plumbing: APIs

- APIs matter
  - define consistent, concise API
  - don't expose the implementation
  - develop implementation and client at the same time
- define APIs for stability
  - binary compatibility is highest priority
  - we would rather provide less API than desired (and augment) than provide the wrong (or unnecessary) API and need to support it indefinitely

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component centric

- component centric development
  - a team is responsible for one or more component
- dependencies through APIs
  - ensures high velocity development inside a component
  - eclipse 3.1 provides tools support to check for API access violations
  - define producer/consumer relationships among components
    - tension among components is healthy for coming up with good component interfaces/APIs

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APIs first

- APIs don't just happen; we need to design them
- specifications with precisely defined behavior
  - what you can assume (and what you cannot)
  - it works ≠ API compliant
- must have at least one client involved, preferably more
- need an API advocate
  - we all care about having sustainable APIs
  - need someone who lives and breathes APIs

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practical extensibility

- extensible in ways that are known useful
  - needed by us, requested by others
- we don't provide hypothetical generality - we want to be extensible in ways that matter
  - don't over generalize

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API tension

- conflict
  - APIs need to be implemented and used to be right
    - requires iteration
    - needs external client
  - stable API necessary
    - for widespread adoption
- resolution
  - don't commit API before its time
    - APIs can (and should) change during the release to accommodate new requirements, experience

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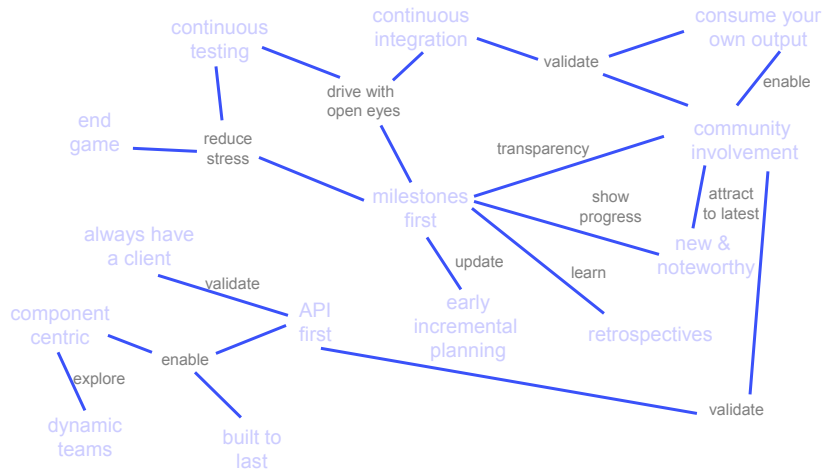
summary



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confessions

- ripples - a change in a lower layer that propagates up
  - we often underestimate the impact on upper layers!
    - consequence: end game swirls and stress
  - ground rule:
    - you are not done unless the upper most layer has digested the ripple
- dynamic teams – not all efforts are successful
  - require leadership, feeling of responsibility
  - require even more detailed planning
- we drop features!
  - but we hate to drop committed items

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summary: how extreme is eclipse?

- ✓ *testing early, often and automated*
- ✓ *incremental design*
  - Yes but API stability is important to us
- ✓ *daily deployment*
- ✓ *customer involvement*
  - even better we have an active community
- ✓ *continuous integration*
  - nightly, weekly, milestone
- ✓ *short development cycles*
  - 6 week cycles
- ✓ *incremental planning*
  - start with embryonic plan
  - refine after each milestone

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conclusion

- the team makes the process work
- the team defines and evolves the process

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