Continuous Engineering
What’s new in 6.0.4?

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Offering Managers
IBM Watson IoT

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IBM IoT Continuous Engineering Solution

- Requirements practices
- Systems engineering
- Model-based engineering
- Simulation
- Automated testing
- Automated build and deployment pipeline (DevOps)
- Change management
- Version and configuration management
- Iterative / agile / lean practices
- Automated reporting and doc generation
- Regulatory compliance
IBM IoT Continuous Engineering Solution – Primary Products

Rational DOORS and DOORS Next Generation
Rational Rhapsody and Design Manager
Rational Team Concert
Rational Engineering Lifecycle Manager
Rational Publishing Engine
Rational Quality Manager
Rational Method Composer
### High-level roadmap - Functional

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>6.0</th>
<th>6.0.1</th>
<th>2016</th>
<th>6.0.2</th>
<th>6.0.3</th>
<th>2017</th>
<th>6.0.4</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Reuse in complex product and systems dev.</strong></td>
<td>Global Configs with req, test, models, code</td>
<td>PLE with feature modeling (w/BPs)</td>
<td>SCM for regulated and component-based SW dev</td>
<td>Fine-grained components</td>
<td>Rhapsody model server with CfgM and traceability</td>
<td>File links</td>
<td>Large files</td>
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<tr>
<td><strong>Business-driven: Agility at Scale, Lean, Kanban, Reporting</strong></td>
<td>Agile tracking and planning at scale: Quick Planner &amp; Scaled Agile Framework (SAFe®)</td>
<td>Self-serve reporting with Report Builder</td>
<td>RPE Document Builder and simplification</td>
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<tr>
<td><strong>Simplicity for practitioners and administrators</strong></td>
<td>User experience improvements (on-going)</td>
<td>MyStuff for program collab.</td>
<td>JMX MBeans for monitoring</td>
<td>Quick Deployer</td>
<td>Simplify admin with containers and ops console</td>
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<tr>
<td><strong>Open Platform based on Industry Standards</strong></td>
<td>OSLC v2</td>
<td>OSLC v3 Draft: CCM, ALM-PLM integration</td>
<td>Jazz Platform / Open APIs</td>
<td>Git, GitHub, Gitlab integrations</td>
<td>Work Item creation on Git commit</td>
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</table>
# High-level roadmap - Non-Functional

<table>
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</thead>
<tbody>
<tr>
<td><strong>Enterprise performance and scale</strong></td>
<td>DNG 2.5M reqs/server</td>
<td>DNG 5M reqs</td>
<td>CE with 50K+ users</td>
<td>Clustering RTC</td>
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<tr>
<td></td>
<td>QuickPlanner for stand-ups</td>
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<tr>
<td><strong>Enterprise security</strong></td>
<td>Open ID Connect</td>
<td>Digital Certs / Smartcards</td>
<td>Hidden fields in RTC Build</td>
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<td></td>
<td>Kerberos / SPNEGO</td>
<td>SAML</td>
<td>SCIM</td>
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<td></td>
<td>SSO</td>
<td>Jazz Authorization Server</td>
<td></td>
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</tr>
<tr>
<td><strong>Cloud / SaaS</strong></td>
<td>CLM on Cloud (SaaS)</td>
<td>Concurrent Users</td>
<td>FedRamp Assessment</td>
<td>US Federal</td>
</tr>
<tr>
<td></td>
<td>Compliance: ISO 27002</td>
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<td></td>
<td>Data centers: USA, UK, Germany</td>
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</table>
Configuration management of linked lifecycle artifacts enables parallel development and merging.

Some reasons for parallel development:
- Shared artifacts
- Overlapping releases
- Product variants
Strategic Reuse of Linked Lifecycle Data

Global configurations:
- Component reuse in Product Line Engineering (PLE)
- Feature modeling with partners
Configuration Management Improvements

- **Easier to organize, find, understand**: group your global components with hierarchical tags
- “Create a baseline hierarchy” action now creates baselines of RTC source control streams
- **Implement your custom engineering process**: specify whether an attribute or link can be modified on baselines
- **Drag and drop configurations** from RM, QM, CCM, DM, GCM into a global configuration tree
- **Just type to search/filter** in the Add Configurations picker
- Scrub global configurations and components after data spills
IBM support of Scaling Agile

Support for SAFe 3.0 for Program (RTC) and Portfolio (CLM) delivered
SAFe 3.0 reports

SAFe 4.0 “beta” support delivered
CLM LPA capabilities for SAFe 3.0 Portfolio

SAFe 4.0 support generally available SAFe 4.0 reports

SAFe 4.0 “beta” support generally available SAFe 4.0 reports

Support for SAFe 4.0 for Program (RTC) and Portfolio (CLM) delivered
SAFe 4.0 reports

Advanced SAFe 4.0 Reports:
- Program Velocity
- Sunset Graphs
- PI Performance
- Scope Added/Removed
- Progress Measure

Updated templates:
- RDNG: Embedded process guidance
- RTC: Team Kanban, “mvp” and “stretch” attributes

SAFe 4.5 “beta” support
- Templates, Configuration Guidelines

Updated reports
- New report “packaging” for SAFe and non-SAFe tooling environments
- Additional reports (in progress)
- Burnup/Burndown
- Iteration Health
- Resource Allocation
- Cumulative Flow
- Release Predictability

jazz.net/safe
Agile Boards: Process vs. Flexibility

There is a tension between centralized tool teams who want to manage a consistent workflow and developers/teams who want total flexibility.

**RTC Quick Planner Next** addresses this tension
- Define the minimal states and workflow needed across all teams
- Then allow teams to experiment and build flexible boards
- Process based and tag based co-exist together

Learn → Adapt → Reflect → Change
- As more teams adopt better tag based workflow ideas, you can adapt future process to include the best practices from experimental teams
You can now customize the lane settings in the Board. Some of the customization that are supported are:

- Rename the lane
- Configure the lane for specific states
- Filter by tags
- Presentation
Users can build a completely tag-based board without being bound by the state groups or states defined in the process template. Users can also have boards that combine tags and states.
RTC Quick Planner Next - Flexibility

- The boards are highly flexible. The number of lanes that appear is determined dynamically by screen size.
- You can now pin down more than one lane – and slide swim lanes underneath.
**RTC SCM – Rollback Stream or Workspace**

- **Ability to Rollback in RTC SCM**
  - Need to roll back a workspace or stream to a last known good state?
  - Or rollback to a state when a specific operation was performed?

- **The Operation History View now supports rolling back an entire workspace or stream to a point in time.**
RTC SCM – Control What Gets Checked-In

- Built In check-in advisors for RTC SCM
  - Restrict file size
  - Prevent check-in of files with the same name
  - Prevent Check-in by MIME Type or encoding
  - Restrict change set size

- Or write your own check-in advisor
  - Custom check-in advisors – for example – manage export control of code variants for security compliance and access to global markets
RTC SCM – Code Review Enhancements

- Apply filters to reduce clutter in the navigator panel of the code review tool

- The **Submit Change sets for Review** action now sets the code review target stream based on the flow target of your workspace
RTC - VS 2017 IDE Integration Support

Support for
- VS 2010
- VS 2012
- VS 2013
- VS 2015
- VS 2017

It is also possible to get VS 2017 support on 6.0.3 (Contact Support if needed)
Create work items and link right from the Git command line, or the Git tool of your choice

- Use the actionable commit message
- The syntax for creation is an extended version of our quick planner work item creation syntax

The following example shows a Git commit message that creates a work item in Rational Team Concert:

- "Git commit message #create *Task ^\"JKE Banking Project area\" @:ADMIN $High #tag1 duration:4d3h Complexity:2 This is my work item summary"
IBM Rational Quality Manager
Agile Testing and Quality Management

- Requirement driven-testing with traceability
- Agile Test Planning
- Flexible Manual Testing
  - Online and offline
  - Test case, script reuse
- Drive test automation tools
  - Out-the-box integrations
  - Command line or APIs
- Team collaboration
- Reporting and Analytics
RQM - Roll-up Test Results

- Test Suite
- Manual Test
- Test Data
Reporting with Jazz Reporting Service – Report Builder

• Self-Service Enterprise Reporting
  • Measure program, project, and team-level progress
  • Consistent metrics across an organization

• Agile & DevOps out-of-the-box reports
  • Burn-down & Burn-up reports

• Report & Dashboard elements that are easily created by anyone

• Calculated Roll-up & Report drill-through

• Traceability reports across domains and projects/teams

• Export to Excel, Rational Publishing Engine, Image
Reporting – JRS Report Builder

- More expressive, complex reporting …
- Traceability relationships with different source artifacts
- Branched traceability paths
Reporting – JRS Report Builder

- Easy custom expressions (calculations)
- Easier filtering: set report filters directly from the column headers
- Use colors to highlight data in tables
- Easier export: direction from report or graph in more formats or to RPE for more custom formatting

Export the report to Microsoft Excel
Export the report to Rational Publishing Engine
Export the report to Microsoft Word, PDF, or HTML
Export the report to Watson Analytics
Export the report to a PNG image
Export the report to an SVG image
Rational Publishing Engine
Document Generation

- Extend the Reach
  - Added support for template design and document generation using JSON
- Asset Privacy, Visibility & Permissions
  - Adding Owners to assets
  - Permissions for owners
  - For Templates, Stylesheets, Scripts & Reports
- Usability
  - Comparison
  - Redesigned Welcome Screen
  - Pre and Post commands in RPE Document Builder
- Scalability Improvements
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The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

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VISION
Be the undisputed MBE choice for mid/large enterprises

MISSION
To give organizations the opportunity to manage the increasing complexity they face in product and systems development. This by providing leadership and innovation with the purpose to improve business outcomes and decisions for our clients.
- Stay industry and market relevant – not only customer focused

- Work with customers/industry/experts to handle and manage foundational items as part of solving detailed situations

- Utilize IBM – as a leading innovator in the world and as an organization with market leading capabilities in cognitive, IoT, analytics and cloud for example – Rhapsody should utilize this for the benefit of our clients.

- Be transparent and communicate!
2017 and forward….

- **Usability**
  - Consistency/GUI

- **Allow our customers to lifecycle enable Rhapsody models**

- **Allow for larger more complex constructs**

- **Standards/Language/Industry - adherence**
  - Align in most relevant areas for market and customers - specialization on our target domains
## Offering Plan – high-level perspective

### Key Theme(s)
- Usability
- Model Based Testing
- Standards Alignment
- Scalability (DM)

### User value
- End User Experience
  - Easier adoption/Quicker time to value/Ease of use
  - Verification and Validation (early and often)
  - Performance Improvements
- Key Capabilities
  - UI & Diagram Improvements
  - Model Management and SysML enhancements
  - Scale and Performance
  - Model Based Testing

### Horizon I (Near-term)
**Next Release**
- With market and customer input as the basis - continue down the path of improving usability. Continue approach for a tighter and more robust integration to IBMs CE platform and update our support for standards and languages.
  - Usability / Consistency
  - Collaborative Design
  - Lifecycle Integrations
  - Standards / Languages / Industry Adherence
  - Model Based Testing / Reporting
- "Becoming the leading tool of choice covering the complete development process". Help our customers improve their competitive advantage by allowing them access to more sophisticated functionalities.
  - (Cyber Physical) Simulation, analysis and visualization
  - A cognitive Rhapsody
  - Improved model interoperability
  - IoT connections (IoT Platform, Bluemix)

### Horizon II (Mid-term)
**Next 2-3 Releases**
- Quicker time to value / Ease of use
- Improved collaboration/Better lifecycle process
- Lifecycle traceability
- Improved reporting and document generation
- Improve ability to fix errors as they are introduced
- Accurate decision making (with traceability)
- Improved risk management
- Improved product quality and quicker time to market
- Leverage IoT in a more effective manner

### Horizon III (Long-term)
**Beyond**
- Consistency/Usability
- JRS, RPE - improvements
- SysML, UML, AUTOSAR, Safety Standards
- Model Based Testing
- FMI/FMU support, Modelica Integrations
- Watson for Cognitive
- IoT enabled via for example IoT Platform, Bluemix

### Horizon IV (Near-term)
**Next Release**
- JRS, RPE - improvements
- SysML, UML, AUTOSAR, Safety Standards
- Model Based Testing

### Horizon V (Mid-term)
**Next 2-3 Releases**
- FMI/FMU support, Modelica Integrations
- Watson for Cognitive
- IoT enabled via for example IoT Platform, Bluemix

### Horizon VI (Long-term)
**Beyond**
- FMI/FMU support, Modelica Integrations
- Watson for Cognitive
- IoT enabled via for example IoT Platform, Bluemix
Plan - 2016 and 2017 Releases

2016
- Released in Q2: Rhapsody 8.1.5 and Design Manager 6.0.2
  - eGA April 25

- Q4: Rhapsody 8.2 and Design Manager 6.0.3
  - eGA December 5

2017
- Q2: Rhapsody 8.2.1 and Design Manager 6.0.4
  - eGA June 12

- Q4: Rhapsody 8.next and Design Manager 6.next
Rhapsody 2017
Rhapsody  8.2.1 (2017 Q2)

Support 64-bit workstation (windows only) for larger model support and better performance
  • Support ReporterPlus/64 bit
  • Enable Rhapsody Architect for SW/64 bit

Simplify use of configuration management (in RTC Direct integration)
  • Support auto check-in/auto deliver

PLE integrations: improve decoration styles and performance for feature modeling integrations

Enhance inferred mechanism (reduces effort to maintain model consistency)
  • Inferred Flows & Item Flows in BDD from Action pins in AD

General usability
  • Export properties information into a CSV file

Diagram usability
  • Support quick navigation on all Box elements
  • Add context-sensitive hovering diagram toolbar
  • Extend populate/re-arrange diagram algorithms
    • Provide new populate/re-arrange policies

Standards alignment
  • UML 2.4.1/ XMI 2.4 for Import and Export
  • Rhapsody/AUTOSAR revision migration from AR 403 to latest revision
    • Available both directions (up, down)

Tech Preview: New format for Rhapsody repository – based on XML
  • Enable "Future compatibility“ → standard parsing, easier maintenance, better performance
Preliminary: Rhapsody 2017 Q4 Candidates

- **Diagram Usability**
  - Display of "state enter exit reaction" in separate compartments

- **Harmonize UI**
  - Harmonize and align object, class container display options
  - Combo box alignments – additional enhancements
  - Label mode, harmonization of display options

- **Standard Compliance**
  - Metamodel alignments – dependency re-architecture
  - AUTOSAR Migration: Include more AR versions in downgrade use case

- **Model Based Testing**
  - Easier analysis of why requirements are not fully covered by tests
  - Testing of private functions
  - Alignment with Rhapsody support for split dependencies (owner != source)

- **Platform**
  - Productizing of repository change – based on XML (for future compatibility)
• Make tool more intuitive for the end user
  • Reporting
  • Model management improvements
  • Harmonize UI

• Capture the dynamic behavior of the system in a smarter way
  • Activity Diagram Improvements
  • "Complete Relations" to work in more cases
  • Additional workflows of enhance inferred mechanism to support features of elements

• Standards Alignment
  • Enhanced SysML/UML usability/compliance
  • UAF
  • AUTOSAR (adaptive, new revisions)

• Model Based Testing
  • TestConductor Documentation – Quality improvements
    • Continue quality improvements of user guide
    • New tutorials (C++, C)
  • Usability improvements

• Platform
  • Java API Compatibility
DOORS Family
The DOORS family
your answer across all project methodologies

DOORS Next Generation extending collaboration
Previously known as Rational Requirements Composer (RRC)

- Designed from the ground up to drive reuse, collaboration and open ecosystem
- Improved lifecycle integration
- DOORS customers under S&S are entitled to DOORS Next Generation

DOORS – You can rely on the DOORS 9.x products for many years

- Proven in complex and highly regulated environments
- Enhanced to support adoption of iterative and agile
- Improvements planned for many years to support your use on long standing projects

The trusted, de-facto standard RM tool for employing Systems Engineering methodologies to build complex and embedded systems

The next generation RM solution offering reuse, collaboration & open ecosystem, extending proven DOORS techniques, built on the Rational Jazz platform
Recent updates - DNG 6.0 – 6.0.4
Last released in Q2 2017

In v6.0 we debuted Requirements configuration management with GCM. Since then we have been focusing on maturing these features in the market

- Improvements to compare, delivery and change sets
- Fine grained components
- Workflow and requirements change management
- GCM automation

We have a constant focus on improving usability. Release over release improvements have included:

- Completely re-designed application navigation and query
- Improved module scrolling and performance
- Bulk editing of attributes
- Round trip CSV / Excel

Supporting Data exchange scenarios (ReqIF and migration) has also received significant focus
Streamlined application navigation

Create new information
Using terminology defined by a companies process, not by a tool

Collapse side pane
Making more screen space to see requirements

View tab
Configure how you want typical users to see requirements

Simple Search
Creating an intuitive, fast way to analyse requirements

New area for filters to be edited
Filters get a single defined place to make things simple
Variant development (Multi-stream)

V1 Released. Development continues to V2 and beyond. Variation is needed from V1, so a branch is created from the baseline B1.
What’s new, DOORS Next Generation 6.0.4
Q2 2017

Scalability / architectural work
• Ground work has already begun
• Target H2 2017 to support >50m artifacts in an RM project with associated performance gains

Configuration Management
• Improved control and visibility for requirements changes
  – Compare, merge, delivery and audit

End user productivity
• It should be possible to enter requirements as fast as you can type them

Serviceability
• Stronger support for automated migration/upgrade
• DOORS migration – module types
• RRCx migration
As customers usage of modules increases, so to does scale

- End user performance for requirement manipulation should be faster (create requirements as fast as you can type them)

The Solution

- Move from pessimistic locking to optimistic
  - Previously we negotiate with the DNG server to see if we are allowed to edit a requirement
    - Only a very small number of times will we find that an artifact is locked
    - Assume the artifact can be edited while in the background making sure
      » Benefit: significant performance improvement with a minor risk infrequent conflicts need to be handled
  - Support for “bulk operations” within a module context
    - E.g. set attribute values to all requirements in the view
Bulk edit of attributes in a view

Support for “bulk operations” within a module context:
- E.g. set attribute values to all requirements in a view

Modify:
- Tags
- Workflow state
- Artifact type
- Team area
- Folder location
Configuration Management

A focus around support for change sets

Improved compare
  • Side by side compare of artifacts when performing module compare
  • Compare/merge view to support filtering

Merge to support more use cases around conflict resolution

Faster delivery of change sets from one stream to another

Audit of change sets after delivery
  • Examine a stream and see the content of delivered change sets
Rational Publishing Engine – support for module views

Previously we could only report on
- Pre-defined reports over modules view (table and book format)
- Custom reports over modules (slow)

Custom reports can be made on module views
- Efficient reports based on view filters
- Significantly improves performance
- Recorded savings can be up to a 95% reduction in execution time

Additional help can be found <here>
Reporting on requirements changes

The version compare information available in DNG is not directly printable
  • But you can now use Rational Publishing Engine to generate a report

Use case:
  • Generate a report on base stream
  • Generate a report on the stream to compare
  • Instruct RPE to generate red line mark-up of differences
Serviceability

Support tools
- “diff” tool to verify migration, before and after the event
- Automation of support requested data files from the DNG server
- Interactive client side logging

DOORS Migration
- 6.0.3 introduced support for artifact types.
- 6.0.4 introduces support for module types
  - Translate DOORS modules into DNG module types, controlled by a module attribute
Semantical Aware Requirements Management
Pilot Projects underway

- Operational data used as inputs for Requirements analysis/elicitation
- Requirements Quality Assessment
- Detect similar and/or duplicate requirements
- Automated lifecycle transition from requirements to design
- Model Based Systems Engineering

Operations
Field Engineer

Manufacturing
Industrial Engineer

Engineering
Systems Engineer

IBM DOORS (Classic)
IBM DOORS Next Generation

IBM Watson Knowledge Studio

IBM Rhapsody

IBM DOORS (Classic)
IBM DOORS Next Generation