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## Développements applicatifs Java pour les mobiles

J2ME, Websphere Studio Device Developer et Test RT

**Lotus** software

A decorative horizontal bar with a variety of colorful icons and patterns, including a red square, a purple square, a cyan square, a green square, a yellow circle, a magnifying glass, a grid of dots, a person's face, and several human figures, is located above the footer.

@business on demand software

Nestor Bonifas

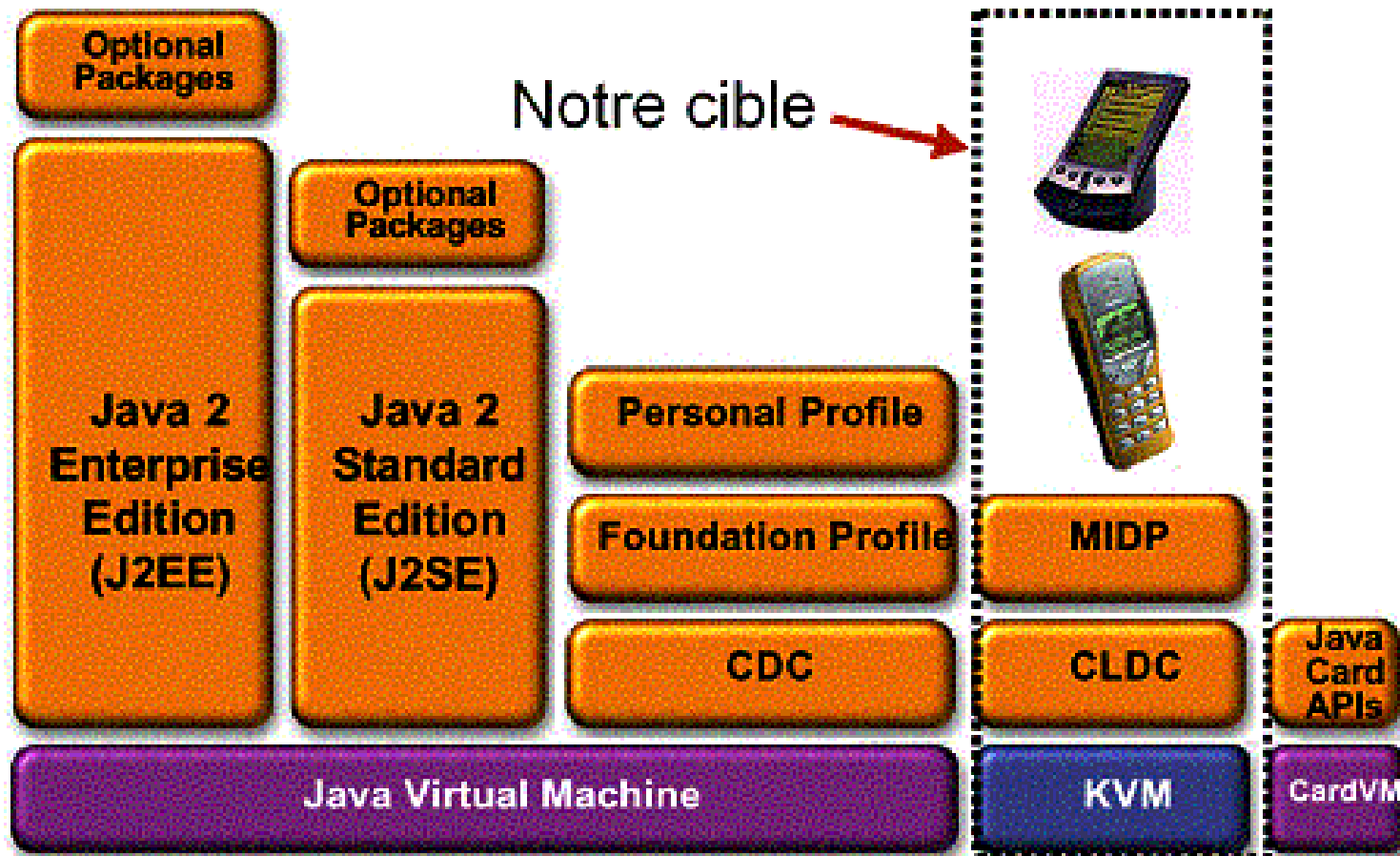
Lotus software

# Agenda

- “J2ME” ...
- Outils de Développement
- Rational TestRT



# Java™ 2 Platform



## J2ME Java Mobile edition

- JVM = KVM Kilobyte Virtual machine
- API's de deux types
  - ▶ Configurations: CLDC Connected limited device configuration
    - API Java de base
    - API spécialisée accès réseau mobile (javax.microedition.io.)
  - ▶ Profiles:
    - MIDP Mobile information device profile
      - Gestion interface utilisateur
      - réseau (WSP wireless session protocol)
      - BdD embarquée
    - PDAP pour PDA
    - Multimedia





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# Developpez

**Lotus** software

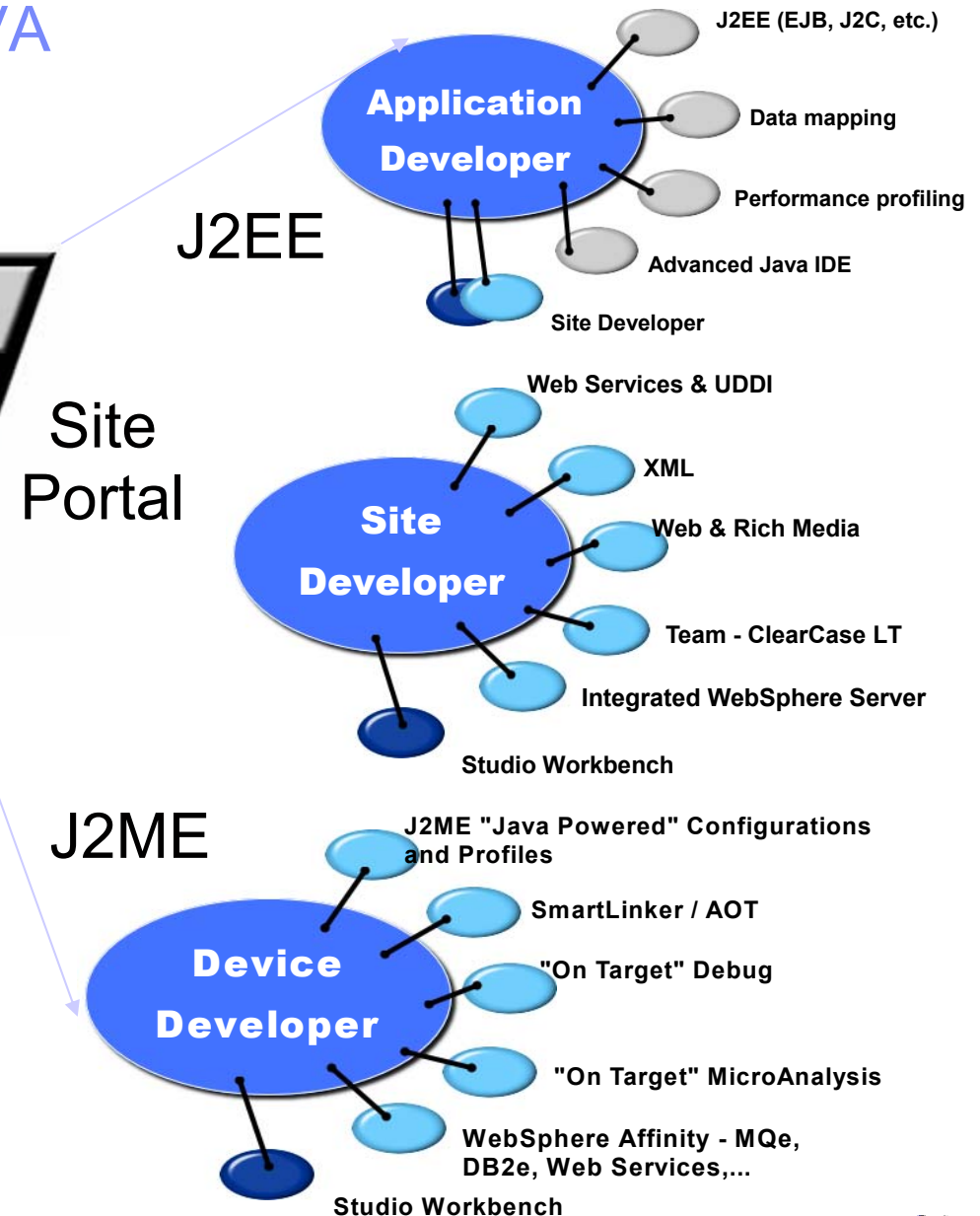
A horizontal decorative bar with a variety of colorful icons and patterns, including a red square, purple square, cyan square, green square, yellow circles, a microscope, a grid of dots, a person's face, and stylized human figures, is located above the footer.

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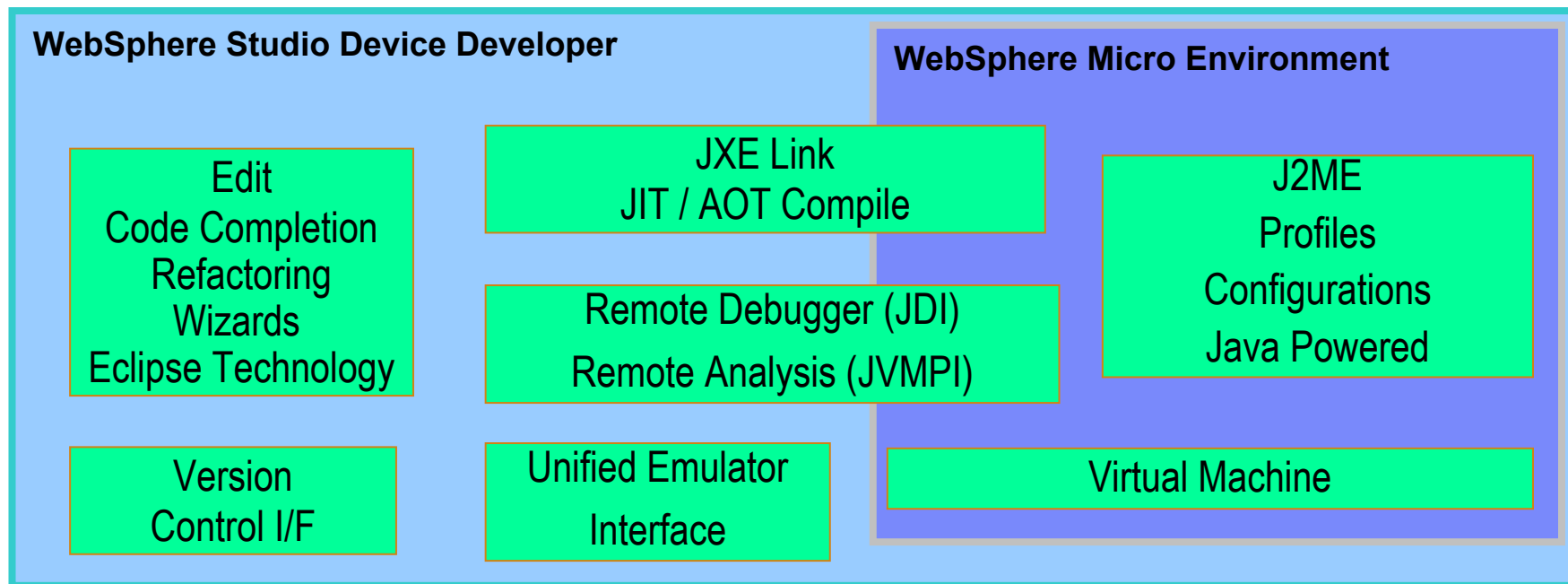
## Developpements applicatifs JAVA



- Basés sur les Standards
  - ▶ Powered by Eclipse technology
- Productivité grace à l'intégration
  - ▶ Les outils sont imbriqués
  - ▶ IBM, OEM and ODM
- Les outils couvrent les divers terminaux
  - ▶ Globalisation et réutilisation



# WebSphere Studio Device Developer



- Environnement intégré de développement:
  - ▶ Interface ouverte pour l'arrivée rapide de nouveaux "émulateurs"
  - ▶ Contrôle de version robuste pour des tests orientés émulateurs multiples



## Websphere Studio Device Developer

- Tools for developing embedded software applications and tuning WEME for specific platforms
- Designed to integrate with WCTME
- Part of the WebSphere Studio family
- Built on Eclipse
- Sold per seat and come with development runtimes
  - ▶ Target ISVs for app development, OEMs and platform developers for WEME tuning and porting
  
- Les autres...
  - ▶ Sun Wireless Toolkit (Sun)
    - ▶ Market leader for wireless(+),
  - ▶ Codewarrior (Metrowerks)
    - Market leader for embedded(+), broad support(+), not integrated with backend tooling(-), no runtime(-)
  - ▶ Jbuilder (Borland)
    - End to end (+), broad offering(+), no runtime(-)
  
  - ▶ Visual Studio (Microsoft)
    - Integrated back end support(+), only supports MS products (-), no Java(-)



Build applications based on J2ME™ Java Powered™ profiles and configurations.





# Workplace Client Technology Micro Edition Market Traction

## Micro Edition Customer Scenarios

### Productivity Services

-  **BLUE MARTINI SOFTWARE**
- Mobile CRM offering
- IBM ESWE technology



-  **NISSAY**
- Mobile Insurance App
- IBM ESWE technology



- Zaurus Mobility Solutions
- IBM Workplace Client Technology Micro Edition

**SHARP**

- Enterprise Mobility Solutions
- IBM Workplace Client Technology Micro Edition

**symbol**  
The Enterprise Mobility Company™

### Extended Mobile Applications & Services

- IBM Workplace Client Technology Micro Edition



**palmOne**

- Enterprise Mobility Solutions
- IBM Workplace Client Technology Micro Edition



**NOKIA**  
CONNECTING PEOPLE

**Intermec**

- Industrial RFID & Rugged Mobile Solutions



**HONDA**

- Accord, Acura MDX
- IBM Embedded ViaVoice

**OnStar**

- IBM Embedded ViaVoice
- 51 GM car models!



**Arcom**

- Industrial Solutions
- RFID, Sensors

**VISA**

- SmartCard
- IBM Chip OS


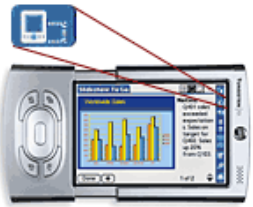



**Prudential Financial**

- IBM WebSphere Voice Server
- Improved customer sat



## palmOne IBM JVM device support (as of 2/5/04)

Device	Palm OS	IBM JVM & JSR's	Delivery date/Availability
<p>Tungsten C</p> <ul style="list-style-type: none"> <li>INTEL PXA255 (ARM) 400MHz</li> <li>Wi-Fi</li> </ul>  <p><b>TUNGSTEN   C</b></p>	5.2.1	<p>WME 5.6: 68K/PACE (MIDP 1.0) ARM (MIDP 2.0)</p> <p>JSR's: CLDC 1.0 (JSR 30), CLDC 1.1 (JSR 139), MIDP 1.0 (JSR 37), MIDP 2.0 (JSR 118)</p>	<p>68K/PACE is GA now ARM is now Beta ARM GA will be 3/04</p> <p>Available from palmOne and IBM</p>
<p>Tungsten T3</p> <ul style="list-style-type: none"> <li>INTEL® XSCALE™ (ARM) 400MHz</li> <li>Bluetooth</li> </ul>  <p><b>TUNGSTEN   T3</b></p>	5.2.1	<p>WME 5.6: 68K/PACE (MIDP 1.0) ARM (MIDP 2.0)</p> <p>JSR's: CLDC 1.0 (JSR 30), CLDC 1.1 (JSR 139), MIDP 1.0 (JSR 37), MIDP 2.0 (JSR 118)</p>	<p>68K/PACE is GA now ARM is now Beta ARM GA will be 3/04</p> <p>Available from palmOne and IBM</p>
<p>Treo 600</p> <ul style="list-style-type: none"> <li>144 MHz TI OMAP (ARM)</li> <li>CDMA and GSM/GPRS</li> <li>Sprint, ATT Wireless and Cingular support today</li> </ul>  <p><b>c net</b> Editors' Choice OCT 2003</p> <p><b>Treo 600</b></p> <p>GSM/GPRS</p> <p>CDMA</p>	5.2.1	<p>WME 5.6: 68K/PACE (MIDP 1.0) ARM (MIDP 2.0)</p> <p>JSR's: CLDC 1.0 (JSR 30), CLDC 1.1 (JSR 139), MIDP 1.0 (JSR 37), MIDP 2.0 (JSR 118)</p> <p>NOTE: Both CDMA &amp; GSM/GPRS models are supported.</p>	<p>68K/PACE is GA now ARM is now Beta ARM GA will be 3/04</p> <p>Available from palmOne and IBM</p>





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# Anticipez les défauts de votre application avec Rational Test RealTime

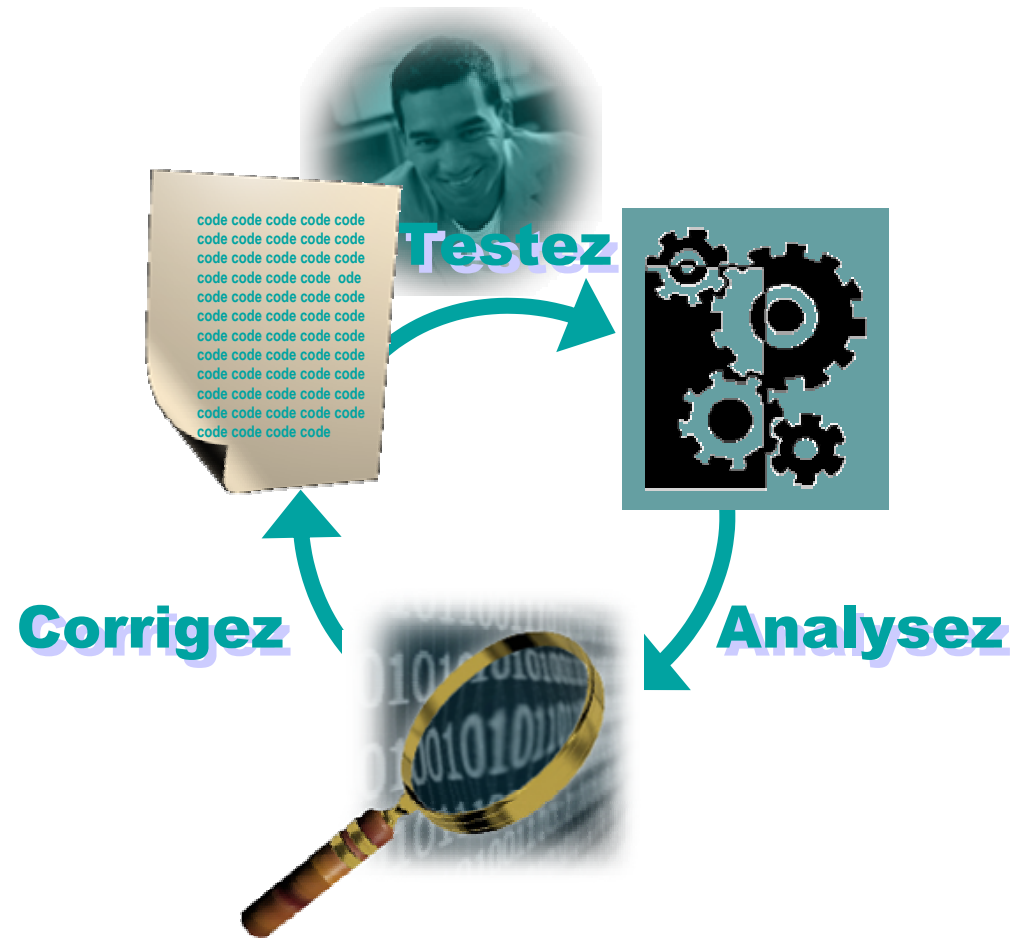
**Lotus** software

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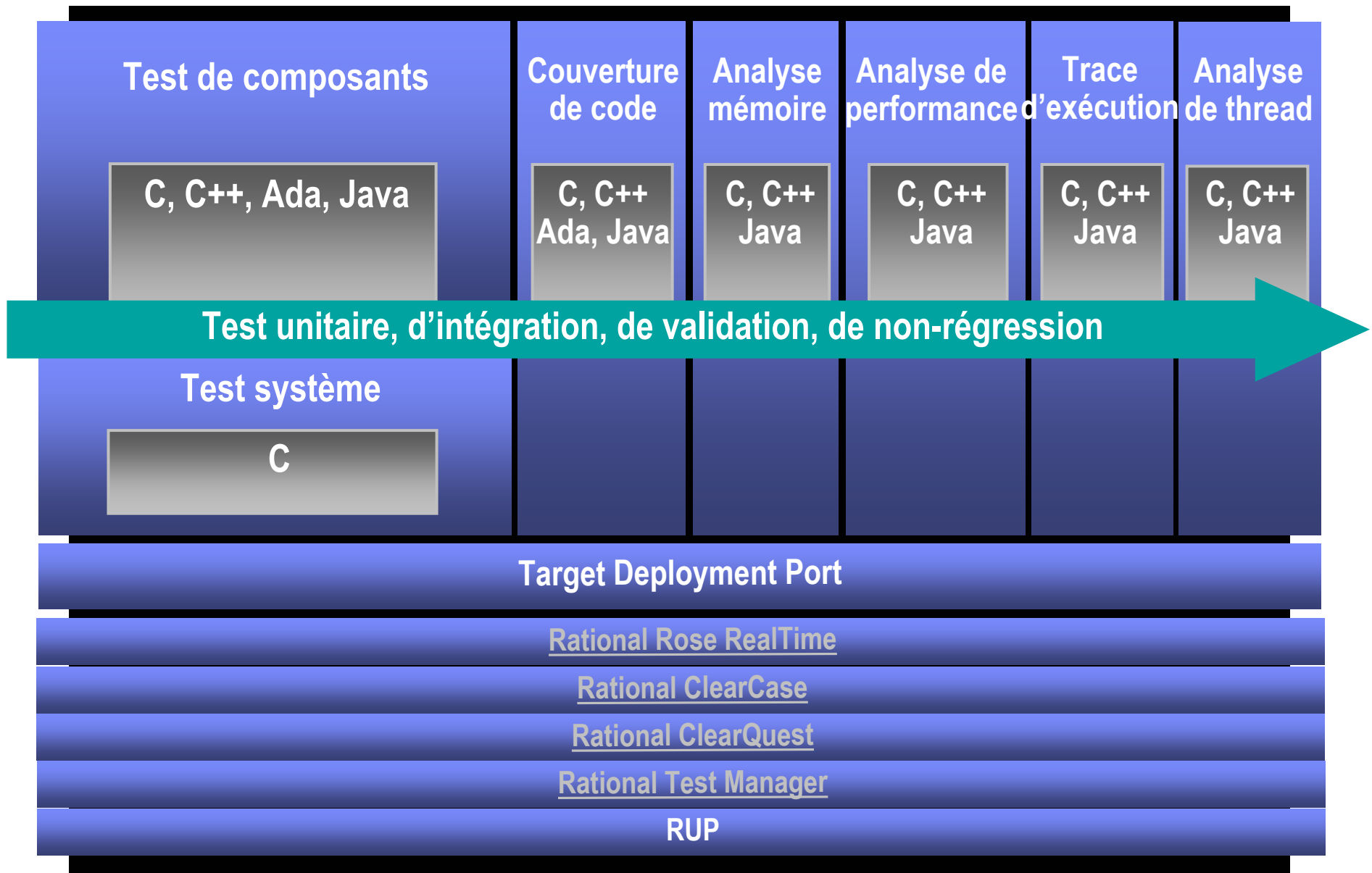
## Augmenter la puissance du test et du debug

- Testez lors du codage
- Analysez pendant le test
- Corrigez votre code



**Corrigez les bugs  
Améliorez les tests  
Et ainsi de suite !**





## Test de composants Java

- **1-Test**
- Pas de langage de script spécifique
  - ▶ Utilise directement le langage Java
- Basé sur JUnit ([www.junit.org](http://www.junit.org))
  - ▶ Un outil gratuit, en open source pour l'écriture de tests unitaires Java
  - ▶ Créé par les tenants d'Extreme Programming (E.Gamma, K.Beck)
- Basé sur des scénarios
- Rapport détaillé
- Utilisation de métriques statiques pour déterminer les priorités
  - ▶ Étude de la complexité du source
- 2-Toutes les fonctionnalités d'**analyse** dynamique :
  - ▶ **Analyse mémoire et de performance**
  - ▶ **Couverture de code**
  - ▶ **Trace d'exécution**



# Rational Test RealTime étend JUnit

## Rational Test RealTime est compatible JUnit

- ▶ Génération automatique de tests JUnit-like à partir du code
- ▶ Réutilisation transparente des artefacts JUnit

## Rational Test RealTime étend JUnit!

- ▶ Extensions :
  - *Support de J2ME*
  - *Points de vérification supplémentaires (Assertion)*
- ▶ Génération automatique de stubs
- ▶ Utilisation de métriques statiques pour déterminer les priorités
- ▶ Rapports détaillés et traces d'exécution
- ▶ Compréhension complète de l'application grâce à l'analyse dynamique
- ▶ Déploiement transparent sur toute plate-forme d'exécution grâce à la technologie Target Deployment Port
- ▶ Intégration avec les outils Rational



# Test de composants Java : *Script de test*

The screenshot displays the Rational Test RealTime IDE interface. The main editor window shows a Java test script for `TestPhoneNumber.java`. The script includes imports for `junit.framework.*` and `baseStation.PhoneNumber`, and defines a `TestPhoneNumber` class that extends `TestCase`. The class contains methods for `setUp()`, `tearDown()`, and `testCleanNumber()`. The `testCleanNumber()` method performs several assertions using `verifyEquals()` to validate the state of a `PhoneNumber` object.

Annotations on the left side of the image identify key elements:

- Framework JUnit**: Points to the `import junit.framework.*;` line.
- Classe Java sous test**: Points to the `public class TestPhoneNumber extends TestCase` declaration.
- Template généré automatiquement**: Points to the `super("TestPhoneNumber");` line in the constructor.
- Scénario De test**: Points to the `testCleanNumber()` method.
- Points de vérification Test RealTime**: Points to the `verifyEquals(obj.isEmpty(), false);` and `verifyEquals(obj.isEmpty(), true);` lines.

The Project Browser on the right shows the project structure for `BaseStation_Java`, with `TestPhoneNumber.java` highlighted in a red box. The status bar at the bottom indicates the current position is Line: 5 Col: 66.





# Test de composants Java : *Rapports de test*

Utilisation mémoire

Couverture de code (%)

Thread actif

**Symboles dans les traces (✓) (✗) Indiquant le statut des tests**

## ◆ Rapport détaillé

Statut des tests

Résumé des cas test

Statut détaillé

Expression	Status	Executed	Failed	Passed
verifyEquals(obj.isEmpty(),true)	Passed	1	0	1
verifyEquals(obj.isEmpty(),false)	Passed	1	0	1
verifyEquals(obj.isEmpty(),true)	Passed	1	0	1

Expression	Status	Executed	Failed	Passed
verifyEquals(obj.isEmpty(),false)	Passed	1	0	1
verifyEquals(obj.toString(),"123")	Passed	1	0	1
verifyEquals(obj.toString(),"12")	Failed	1	1	0
verifyEquals(obj.toString(),"1")	Failed	1	1	0
verifyEquals(obj.isEmpty(),true)	Passed	1	0	1

Expression	Status	Executed	Failed	Passed
verifyEquals(obj.isEmpty(),false)	Passed	1	0	1
verifyEquals(obj.toString(),"12")	Passed	1	0	1
verifyEquals(obj.isEmpty(),true)	Passed	1	0	1
verifyEquals(obj.toString(),"")	Passed	1	0	1