Adaptive Real-time Infrastructure for a complete OMG Model Driven Architecture™
Kabira develops **Adaptive Real-time Infrastructure** software based on the Model Driven Architecture for the creation and deployment of complex, high-speed, transactional, high-availability network-based services and software using the **OMG Model Driven Architecture™**.

**Telecom Services:**
- web & wireless self provisioning
- bandwidth-on-demand
- xDR mediation for voice + data svcs
- instant on wireless & m-commerce
- location based svcs
- voice over IP and packet services
- SLA, LNP and pre-paid management

**Distributed Hosting:**
- hosting & data center session mgmt
- edge and border caching & mgmt
- network state & event caching
- NMS, EMS and event aggregation
- network based process & work flow
- in-memory transactions & roll back
- burst management
A new class of problem in networks

**Assured / Fixed Capacity Networks**
- Technicians activate services
- CSRs on voice calls
- Circuit Switched Hardware
- Service capacity is ‘fixed’
- Offline upgrade

**Burst / Variable Capacity Networks**
- Software activated services
- Web based and IVR front ends
- Packet Switched Hardware
- System is never offline
- Services and SLAs defined in Software

**New Class of Problem for Software**
- Huge bursts of activity and traffic
- Bit rate data mediation & billing
- Managing asynchronous events
- Continuous operations
- Complex Services might require years to design & develop
Kabira’s software is deployed to solve some of the toughest network software problems in the world.

**A New Class of Problem**
- Services that require software
  - Shortage of developers
- Runtime requirements
  - Fault recovery
  - Change tolerance
  - High speed transactions
  - Scaling up to Web or IVR
- Complex Services that require years to design & develop using traditional methods
- Complex system connections

**Kabira Provides**
- Model driven architectures
  - Building software from models
- Kabira Server: *Adaptive Real-time Infrastructure*
  - Caching & aggregation
  - Failover recovery
  - Online upgrades
  - Handling huge bursts
- Pre-built Commercial Solution Frameworks
  - Provisioning & Activation
  - xDR, CDR, IPDR Mediation
  - ASAN & High-Availability
- Adapter Factory
  - NAI / EAI
Network Evolution Has Resulted in Congestion, Slow, Unreliable Services and Chaos

Chaos Driven Network Services
‘a thousand points of failure’
Kabira: Model Driven Applications

Combined with a Real-time Infrastructure

- On-line Upgrades
- Fail-over Recovery
- Aggregated Services
- 200,000+ micro-transactions per second
- Cached Applications, Data, State & Events
Smart OSS: Integration of Network Elements & Applications for all 3 Control Layers

1. Kabira Adapter Factory Automates Adapters for CORBA, Java, XML
2. Caching provides access to data 5 to 10 thousand times faster than disks & networks
3. New apps are created directly from UML models; 100% constructed by design center
Service Engines from Models

100% Code Generated – 100% Standards Based

Service Engines are 100% Auto-Generated Directly from UML and Action Specifications

Next Generation Service

Directly from Rational ROSE® to Running Kabira Cached Applications
Complexity Challenge and **APIs**

Yesterday’s solution - API proliferation - is today’s mess.
From API Centrism to MODELS

**APIs**
- Technology specific
- Encourage hand-coding
- Assume state awareness
- Difficult to “Upgrade”
- Focused on implementation, not desired results
- *Yesterday’s “Register Aware” applications are today’s “API Aware” applications*

**Models**
- Technology Independent
- New ability to **Completely Define** needed solutions without hand-coding
- Simple to Upgrade
- Focused on “What” not “How”
- The new, most valuable form of software intellectual property!
Model Driven Architectures Reduce Complexity

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OMG MDA™ – An Über Specification

- Starts with UML™
- Builds on:
  - CORBA® & IDL
  - JAVA
  - XMI/XML
  - HTTP
  - .NET
- With Support for
  - MOF - the meta object facility and
  - CWM - common warehouse meta-model
Rational / Kabira Alliance Overview

• Kabira has become a Rational Global Alliance Partner for Model Driven Architecture Solutions in Telecom & e-Business

• The two companies are now actively working together to enable new solutions for customers based upon the entire Rational product family and the Kabira adaptive real-time infrastructure platform...from models to executables!

• Kabira provides the proven ‘engine’ underneath Rational tools for high-performance, burst traffic scalability, in-memory transactions, online upgrades and fail-over recovery.
Kabira MDA Case Studies: Wireless 2.5 G

- Migration from AMPS to CDMA
- LHS, CORBA, Oracle (ODBC), CMDA to Switching, Retail POS Interface
- 1.7 Million Subscribers
- Reduction of activation from 3 days to 90 minutes
- 1600 Hours Per day in Labor Reduction

- Short Message based Directory Service
  Mobile user contacts ‘712’ Directory Service
  Name & Number information is sent to Phone via SMS
  All message management is fully transactional

- Full Deployed Design & Development in 9 Weeks from UML Models and OMG MDA

- World’s first SMS push based directory service implementation

- Supports:
  More than 12 million subs and 6,000 operators on 6 servers
Kabira MDA Case Studies: Broadband

- Automated Design & Assign of Optical Fiber Circuits for MAN w/ IP layered services
- Integrate network elements, software activation, BSS apps in a high-availability, model-driven OSS with Adapter Factory
- Replicate solution to 25 metro cities
- Centralized Data aggregation and Work Flow Management
- Project Start: January 2001
- Unit Test: March 2001
- System Live: July 2001

- WDM, ATM, IP services for growing base of ISPs, Corporate Accounts and Carriers
- Custom designed Provisioning & Activation system – 100% from UML & MDA. Supports complete flow-through-provisioning
- Custom designed Billing and Alert Mediation system – handles 10 million++ xDRs/day with massive bursts of traffic due to IP layering
- Can add new, acquired networks into billing fabric in weeks by modeling data directly in UML
Case Studies: Massive Distributed Hosting

- Invalidation service selected as first project – removes out-of-date cached web content from all servers
- Highly distributed environment: 1500 servers today, 6000 world-wide tomorrow
- Node level performance at 7,500 transactional cache events per second
- Massively distributed architecture

- Massive Volumes, Complex Environment, Hundreds of Web Servers
- Requiring Fault Tolerant Application Data Availability Cross-Site Functionality without Lock Delays
- Used UML and the MDA to develop an Application Storage Area Network - ASAN
- Application data in Cache
- 2x increase in number of active Users
- Reduce DBMS by 75%
Kabira MDA Case Studies: Cable & MSO

- Services-on-Demand for Cable, Telco, ISP, MSO provider in Western Europe
- Persistent store to SQL database
- Layered IP services support
- Complex, packet-based IP billing mediation and customer event mediation – distributed to Arbor Billing
- OMG MDA application is first MDA based cable solution in the world built 100% from UML & ASL

- Service Engines on TIB/Rendezvous
- Kabira supports new network services
- TIB supports massive publish / subscribe access to enterprise
- SLAs & QoS for Telecom, Packet services & high-order (layered) data services over heterogeneous networks at high-speed
- New services built 100% from UML/ASL
- Drag and drop Kabira service engines onto the TIB bus
Deployed OMG MDA™ Based Solutions in 16 Countries
Kabira’s Partners
Kabira Service Modules
- Customer Management Agent
- Equipment Serial Number (ESN) Agent
- Rate Plan Agent
- Changes to Service Packages
- Service Activation and Deactivation
- Payments Process Manager

CDMA Wireless Switching for 1.7 Million Customers

Billing and Activation

ODBC - Oracle

Kabira

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2.5 Gb/s Wide Division Multiplexing - Upgradeable to 40 Gb/s

Hades: Model Driven Flow Through Provisioning Application

Hermes: Model Driven Billing, Alert and Event Mediation Application

WDW Optical Switching

ATM Services

Kabira Technologies, Inc.

IP Layered Services

1200 km underground fiber

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