

## Industry: Optical Fiber Metropolitan Network

### Looking Glass Networks

#### Contact:

**Looking Glass Networks**

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**Tools Used:** Kabira, Rational Rose, CORBA and Java

#### Description:

Looking Glass Networks provides dense fiber count metropolitan area network optical rings<sup>1</sup> within North America. Looking Glass offers multiple services including dark fiber<sup>2</sup>, lit bandwidth<sup>3</sup> and collocation. Customers for these services include IXC's, ILECs, CLECs<sup>4</sup>, ISPs and commercial enterprises requiring high-bandwidth IP.

#### Problem:

Hardware and software support for optical fiber services has traditionally been hand designed, assigned and provisioned, meaning that service technicians design, allocate and establish circuits and services by hand entering customer data, equipment locations, and service parameters. In order to offer on-demand services at a low cost, Looking Glass Networks needed to build a unique Operations Support System (OSS<sup>5</sup>) while utilizing existing 3<sup>rd</sup> party hardware and software systems that do the bulk of the work. Such a system, called a 'Flow Through Assignment & Provisioning<sup>6</sup>', platform, has long been a design goal of network service providers. The difficulty of such a system is that it must communicate automatically and reliably between more than a dozen components and allow for constant upgrades for new equipment and features. Typical, hand designed interconnect software has proven unsuitable for either OSSs, flow-through provisioning or continuous upgrades.

**Solution:** Looking Glass chose the following solutions: **(1) Kabira<sup>7</sup>**, adaptive realtime infrastructure software for the creation of new network-based services was chosen by Looking Glass Networks to support the creation and deployment of OMG Model Driven Architecture™ (OMG MDA™) software. **(2) Rational Rose<sup>8</sup>**, a UML modeling tool was used for graphical design and development of OMG MDA compliant software models. **(3) CORBA<sup>®</sup>** and IDL interfacing for switching and routing hardware. **(4) Java** and **XML** interfacing for 3<sup>rd</sup> party software platforms.

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<sup>1</sup> Dense Fiber: Optical Fiber bundles with 216 to 864 fiber cross - sections per cable.

<sup>2</sup> Dark Fiber: Unallocated physical optical fiber for use by carriers

<sup>3</sup> Lit Bandwidth: Bandwidth services including switching and routing

<sup>4</sup> IXC's, ILECs, CLECs: Interconnect Exchange Carriers (long distance), Incumbent Local Exchange Carriers / Competitive Local Exchange Carriers

<sup>5</sup> OSS: Operations Support System as defined by the Telecommunications Management Forum. The OSS layer is situated between the upper layer business software and the physical delivery layer of the network.

<sup>6</sup> Flow Through Provisioning: A system via which new network services are activated without human intervention.

<sup>7</sup> Kabira™: A software server platform that fully supports the OMG MDA for software creation and deployment, including both a massively cached application server and adaptive realtime infrastructure.

<sup>8</sup> Rational Rose®: A visual UML modeling solution and tool for translating high-level requirements into a resilient, component-based architecture.

Kabira's server software platform integrates all levels of the optical network and aggregates them into one cohesive system view. This enabled Looking Glass to auto-provision new optical services without a large staff of technicians. The system architecture provides management of customer data between applications, automated circuit routing, inventory coordination, status monitoring and data/traffic mediation. In addition, because all services were built using the OMG MDA specifications, the system is effectively 'future proof' against new lower-level standards and technologies. OMG MDA models provide for a Platform Independent Model (PIM<sup>9</sup>), which ensures that Looking Glass has the ability to rapidly accommodate inevitable but presently unknown new technologies.

Kabira enables these new services to be created quickly due to high-level UML models. By using standard UML models designed in Rational Rose and the Kabira platform, network designers at Looking Glass were able to do critical parts of their implementation at the more efficient and less error prone modeling level. "The OMG MDA was chosen for service engine development because it is more than 50 times as efficient than hand coding in 3GLs. Service providers do not have the years it would take to develop new software via hand coding," said Grover Righter, Kabira's Vice President of Technical Strategy.

### **Customer Statement:**

"We want to buy best-of-breed software where it exists. We develop in-house software where it has a clear and unique added value to our network service customers. There is nothing that gives us this ability short of developing new software using model-based architectures. The OMG Model Driven Architecture standard maps neatly onto optical fiber services because we prefer UML models at the top, and we rely on CORBA, JAVA and XML for system interfacing underneath," said Harold Teets, Vice President and Chief Information Officer for Looking Glass Networks.

### **Consumer & Business Benefits:**

Carriers, ISPs and businesses needing network capacity benefit from low-cost, rapidly provisioned high-bandwidth services. End customers benefit due to a reduction in the 'metro bottleneck', which normally causes congestion in network services after the long haul providers drop off data to old style copper networks. In many cases, replacing metro area copper bandwidth with optical fiber bandwidth, customers see more than 1000 times increase in apparent throughput.

Financial improvements were largely based upon lower cost-to-deploy and earlier revenue-generation ability. Many months of delays were avoided by using the OMG Model Driven Architecture, via CORBA, JAVA, XML, Kabira servers and Rational Rose.

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<sup>9</sup> PIM: Platform Independent Model – a high-level abstraction of the software that includes UML models, data, state and events complete with conditional control in an action language.