

CORRIGENT SYSTEMS, INC

Corrigent's Commercial Value Proposition

KDDI, a case study

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1 Introduction

In 2003, Japan's KDDI became the first service provider to transform their transport network and adapt as the traffic profile shifted in favor of packet services. This was done considering KDDI's long term view, in which a more efficient transport infrastructure was required to satisfy the requirements of their future IP-enabled wireless and wireline services.

KDDI's network covers the entire country of Japan and serves KDDI's business and residential customer base in more than twenty large metropolitan areas. The quick and efficient deployment of packet transport technology during the past three years has allowed KDDI not only to make more efficient use of the transport network resources, but also to minimize short and long term investment in the transport network, and to enable new IP and Ethernet services, which have rapidly become an important source of revenue for KDDI.

Corrigent Systems' CM-100 Packet Transport Switch (PTS) is at the heart of KDDI's packet transport network. The deployment of the CM-100 PTS by KDDI in 2004 has since consolidated Corrigent's leadership in the optical packet transport market, which eventually led to the development of Corrigent's CM-4000 PTS, the most advanced packet transport system available today.

According to KDDI's periodic quality assessment report, Corrigent Systems has demonstrated unparalleled commitment to excellence and been credited by KDDI as able to provide the highest quality in terms of performance, reliability and customer support.

To this date, Corrigent's PTS is recognized by customers and competitors as the most advanced and mature packet transport solution available in the market. Corrigent's CM-100 and CM-4000 product lines offer the highest levels of availability, scalability and performance, and today combine to provide network architects with a viable strategy for migrating towards all-IP network services and architectures.

Corrigent's PTS technological benefits also translate into clear economic advantages for service providers.

For example, Corrigent's packet transport technology enables the convergence of multiple technologies, including TDM, ATM and Ethernet, over the same transport network infrastructure, effectively reducing CAPEX by eliminating dependencies on legacy and technology-specific equipment, while at the same time enabling a considerable reduction in OPEX through the consolidation of operational support centers and reduction of provisioning time, effectively increasing service velocity and reducing inventory costs.

Low CAPEX represents only the beginning of the life cycle of the costs associated with acquiring and deploying Corrigent's equipment. In deployments such as KDDI in Japan, Corrigent's CM-100 PTS has been proven to maximize the return on investment (ROI) by enabling new revenue-generating services from day one, positively affecting the company's annual rate of return. Furthermore, considering all costs associated with personnel training, equipment spares, planned and unplanned maintenance, performance objectives, security and disaster recovery, Corrigent also guarantees a considerable reduction in the Total Cost of Ownership (TCO) compared to the alternative solutions and previous mode of operation, therefore increasing the economic value of investment in Corrigent's innovative technology.

The following sections describe Corrigent's economic value proposition and operational experience gained during the deployment of KDDI's packet transport network.

2 Selecting Corrigent for KDDI's Packet Transport Network

3G wireless subscribers in Japan represent more than 60% of the total number of 3G subscribers worldwide. This, in great part, is due to KDDI's success during the past three years, in which KDDI witnessed an unprecedented growth in subscriber numbers, exceeding 9.4 million 3G mobile customers by the end of 2006. Consequently, after completing the migration from second to third generation mobile services, KDDI's 3G WIN service, which includes full-length music download, mobile Internet, and full-browser



internet access, became the most profitable and fastest-growing 3G service in the world. This year, KDDI announced the migration to EVDO Rev. A, which will allow the company to offer new services, including VoIP, push to talk and multiplayer gaming, which are projected to become another important source of revenue for KDDI. It should be noted that the backhaul of KDDI's WIN traffic is done over Corrigent's CM-100 packet transport network, which provides multiple economic and operational benefits to KDDI, including facilitating the migration to EVDO Rev. A.

In 2003, hoping to build on the success of its wireless services unit, KDDI announced it would begin offering new wireline services including KDDI's Hikari-Plus Triple Play service, Business Ethernet and Metal-Plus (VoIP over copper), targeted to residential and business customers and delivered over DSL and PON technologies. In order to minimize investment and ensure profitability, KDDI decided to build a single converged transport network, capable of enabling the delivery of both existing and new wireless and wireline services over a single multi-service packet transport infrastructure.

Hence, KDDI defined the following set of requirements for the new converged network:

1. To build a converged transport network that will allow KDDI to offer a combination of TDM and packet services over a single transport infrastructure.
2. To adopt a scalable network design for the continuous expansion of KDDI's network and exponential growth in customer density per access point.
3. To enable the expansion and integration of wireless and wireline services, ensuring a future-proof network design even considering a dramatic increase in density, capacity and network aggregation requirements.
4. To minimize initial capital investment while maximizing return on investment and minimizing operational costs.

5. To build a future-proof packet transport network to protect investment and extending the amortization period of the network.

After a rigorous evaluation process, KDDI selected Corrigent's CM-100 PTS as the top technical solution and the only one capable of fully meeting KDDI's cost reduction requirements and offering a viable return on investment strategy.

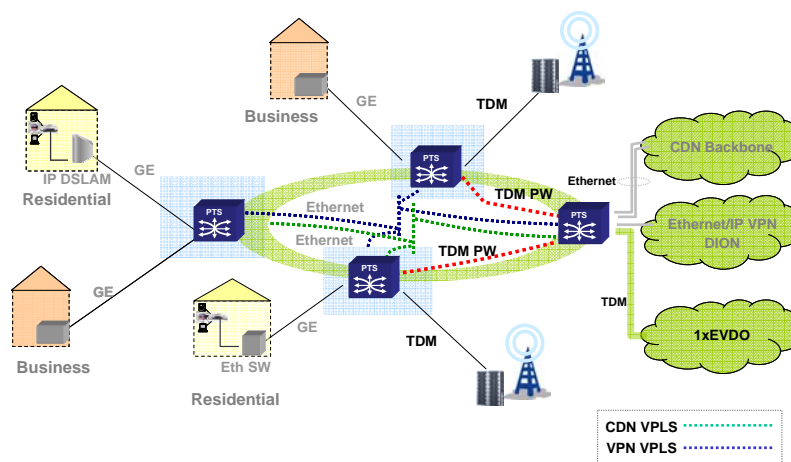


Figure 1. KDDI Packet Transport Network

3 CAPEX Reduction

Corrigent's CM-100 PTS offers an alternative to service providers looking to deploy a converged transport network architecture over which they can consolidate services and transport network infrastructure. KDDI selected Corrigent for its packet transport network, based not only on technical capabilities but also based on the ability to enable a converged packet transport infrastructure for their fixed and mobile services.

Corrigent's CM-100 PTS can perform the functions associated with traditional TDM equipment such as ADM, MSPP and DCS equipment, as well as those functions normally implemented over a packet switching network such as Ethernet or ATM. It effectively enables a dramatic cost reduction by allowing the native transport of data services over a



packet-efficient infrastructure, over which both TDM and data services can be provisioned without requiring a packet network to be overlaid on the TDM transport infrastructure.

CAPEX reduction in Corrigent's packet transport network is therefore achieved through the consolidation of packet and TDM transport, which results in a more efficient allocation of network resources. This, in conjunction with Corrigent's ability to perform TDM-to-Ethernet interworking as well as idle packet and channel suppression, may represent savings of up to 50% when compared to the alternative solutions such as a packet network overlay, and even greater when the alternative is to build separate packet and TDM networks.

Finally, in a network such as KDDI's, whether packet transport is aggregated and transported from multiple local offices towards a regional node, Corrigent can enable important CAPEX savings at the point of interface with service edge nodes by delivering data traffic over an Ethernet interface, rather than a channelized SONET/SDH interface. This, depending on customer density and diversity requirements, may represent savings of up to 75% on this particular interface.

4 OPEX Reduction

The introduction of Corrigent's CM-100 PTS into KDDI's nation-wide transport network enabled KDDI not only to minimize initial capital investment, but also to considerably reduce operational costs by as much as 25% annually. This was possible through a reduction in engineering and support costs, the elimination of multiple layers of TDM transport equipment, and a reduction of third-party maintenance costs associated with multiple equipment vendor deployments.

The CM-100 is considered by KDDI to be a very reliable and efficient transport system, as it minimizes space and power consumption requirements. Moreover, Corrigent's CM-View Network Management System (NMS) was further enhanced to provide a more efficient way of defining and provision services, effectively improving service velocity, and simplifying the allocation and management of resource

for both TDM and packet services across the CM-100 packet transport network.

In collaboration with KDDI, Corrigent developed an efficient Ethernet OAM mechanism, which adds to the other proven reliable methods for monitoring network performance and service integrity, improving service quality and for guaranteeing fast fault identification and correction.

Finally, the consolidation of equipment, network infrastructure and operational support systems enabled KDDI to effectively achieve business efficiency through Corrigent's standardized, reusable business procedures.

5 Return on Investment

Corrigent enabled KDDI to meet aggressive deadlines set to launch the new fixed and mobile network services, accelerating the time to market for new applications, and enabling faster service fulfillment for all data services. The introduction of packet transport technology also allowed KDDI to define new scalable and reliable data services, which enabled KDDI to begin offering new service bundles in direct response to the intense competition from the incumbent carrier, quickly avoiding customer churn and a decline in the average revenue per user (ARPU).

The ability to offer new services, combined with a dramatic reduction in OPEX, provisioning times and improved network reliability, enabled KDDI to maximize the ROI and to guarantee a positive annual return from the large investment in Corrigent's packet transport technology.

6 Total Cost of Ownership

Corrigent's commitment to KDDI was to provide training, integration assistance and customer support according to KDDI's requirements specified in the original business contract agreed upon by the two companies. Corrigent, according to KDDI's quality report, has exceeded expectations and has been ranked among the top three vendors in all key quality aspects that concern KDDI's transport network.



Specifically, Corrigent is today considered one of the top vendors in two of the most important categories: “Quality action item closing performance” and “Failure ratio per month”. Corrigent’s ability to respond to customer’s new requirements, including planned and unplanned upgrades and network outages, coupled with very high equipment reliability, represent important savings in the TCO for KDDI. This, in addition to Corrigent’s disaster recovery processes, the cost of spares and training, and ease of integration into KDDI’s provisioning process and management systems, provides an important commercial benefit.

7 Summary

Corrigent Systems offered KDDI a solution based on its CM-100 PTS product line. After a rigorous evaluation process, Corrigent was selected as the top technical solution, and was considered the only one capable of meeting KDDI’s requirements in terms of initial investment, operational simplicity and return on investment. It was determined that Corrigent equipment reliability in combination with the costs associated with personnel training, equipment spares, planned maintenance, diminished outage periods and disaster recovery procedures, provided KDDI with an overall reduction of the network’s TCO.

Today, Corrigent provides the underlying transport for KDDI’s wireless backhaul network, which provides a packet transport solution that gives KDDI the ability to continue adding customers and services, without the need to upgrade the actual physical transmission capacity of the backhaul network.

The CM-100 PTS is used in several cities in Japan to backhaul 3G wireless traffic, providing efficient transport, guaranteed performance and high availability to KDDI’s fastest growing and most profitable service. Figure 1 illustrates the high-level configuration of KDDI’s converged packet transport network.

The success of Corrigent’s CM-100 PTS led to the development of the next generation packet transport switch in the form of the CM-4000 PTS, today considered the most advanced packet transport platform available in the market.



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