As telephone networks move from TDM to IP, operators and users demand the same high level of reliability from their VoIP service that they have come to expect from traditional PSTN networks. The traditional PSTN phone service has delivered five 9’s reliability based on its fault tolerant design, which uses high-availability switches, back-up connections and redundant power. If there is a failure the equipment used in the PSTN typically supports a low mean time to repair (MTTR) so that faulty hardware can be quickly replaced.

To ensure the same level of reliability and performance, key VoIP infrastructure elements, including VoIP gateways, need to incorporate features for high availability to deal with unexpected operational challenges such as network outages, call volume spikes, power disruptions and field repairs.

Cantata’s IMG 1010™ integrated media and signaling VoIP gateway is designed to meet the performance and reliability challenges of today’s VoIP networks. The IMG 1010 delivers five 9’s reliability by supporting independent and redundant network connections, backup gateway configurations and redundant hardware. A leading independent analysis firm, System Reliability Consultants, found that the total system availability for a redundant IMG 1010 configuration (one active IMG 1010 and one standby) has over five 9’s (99.999%) reliability, allowing network operators to move from TDM to IP with a high level of confidence.

**Independent and Redundant Connections**

VoIP gateways carry signaling and data traffic across their IP connections. SIP and H.323 provide the VoIP signaling, and RTP delivers the VoIP data. Network management on the gateway is also handled via the IP connections. With some VoIP gateways these three requirements (signaling, traffic and management) are carried on the same network connection, which can create contention and operational challenges. For example, a spike in call volume and network traffic can slow down network management access.

To alleviate this problem, the Cantata IMG 1010 provides independent network connections for control, signaling and data (see figure 1). Control lines connect the IMG to the Network Operations Center (NOC) where it can monitor, diagnose and change the operation of the gateway without regard for the network load created by signaling and bearer traffic. In addition, each of these connections can be made redundant and go to the same or different termination points, resulting in greater fault tolerance and reliability.

*Figure 1: IMG 1010 controls, signaling and data via independent network connections*
Backup Gateway Configurations and Load Balancing

Service providers handling large call volumes are always looking to avoid a single point of failure in their networks to avoid outages. Taking a design practice from the data center, the IMG 1010 supports multiple VoIP gateways operating in parallel and works with third party load balancing equipment to distribute VoIP traffic across multiple IMG 1010s based on criteria such as round-robin, quickest response and least number of connections (see figure 2). If one of the network connections fails, the traffic on that link will be automatically redistributed over the remaining links. When using the IMG in an SS7 network, two IMGs can be configured to use the same logical pair to enable redundant SS7 signaling. In the event of failure, the active calls will be shifted to the standby IMG, so that the signaling for the active IMG calls is sustained. A pair of IMGs provides redundant SS7 signaling for up to 16 IMGs.

Figure 2: IMG 1010 supporting multiple VoIP Gateways

Redundant Hardware and Rapid Service

Cantata designed the IMG 1010 with redundant fans and redundant DC power connections so the components with the lowest mean time between failures (MTBF) have built-in backups. The IMG 1010 features a docking station and field-replaceable motherboard tray that allow a network administrator to quickly swap out a motherboard to repair a faulty CPU, signal processor or memory without having to disconnect any cables (see figure 3). This minimizes the MTTR and brings the IMG back online in less than 30 minutes.

Figure 3: IMG 1010 docking station and field-replaceable motherboard tray

Summary

When evaluating VoIP gateways, network operators need to consider several factors that can impact the reliability of their applications and services. With its independent and redundant connections, backup gateway configurations, load balancing, and redundant hardware, the Cantata IMG 1010 can bring the five 9’s reliability of traditional circuit-switched networks to today’s VoIP networks. When combined with Cantata’s world class support and customer responsiveness, the IMG 1010 is the perfect choice to meet the needs of today’s VoIP networks.