



Managing VoIP and IP Telephony

Operations Strategies, Outsourcing & Service Provider Strategies

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IP telephony is finally experiencing an inflection in its growth among large organizations. Intense attention is being directed toward the technology itself, but many risk their services by overlooking its management. Progressive users quickly realize that, while prior technologies have tolerated postponement of management, telephony is a service where management as an afterthought is risky. IP telephony management solutions have been sparse, but this is rapidly changing.

IP telephony (IPT) is finally moving from early adopters to mainstream users. Its reliability and quality are now proving acceptable, and new voice-based business services are being deployed. Management of this new technology is also growing. Currently, a small market (US\$10M-US\$20M total), IPT management will enjoy brisk growth (15%-20% annually) through 2007. It will grow at its fastest rate during 2006 and begin to level off by 2008. At that time, IPT will be integrated into multiple applications as just another user interface, and its management will accordingly diffuse into other management technologies.

Many IT professionals view this market as the management of voice over IP (VoIP). VoIP is undeniably a core building block of IPT. However, full IPT extends far beyond VoIP. VoIP is the protocol for the actual packetized voice traffic over the network. IPT adds services such as call routing, coverage paths, and music on hold for business applications. Commercial management solutions vary from those limited to VoIP traffic management to full IPT management, though the latter class of products is still evolving.

Currently, only a handful of vendors offer IPT management solutions. However, the IPT management market will quickly become crowded, and the shakeout will begin in 2007/08. NetIQ emerged early (in 2001) as one of the first vendors in targeted IPT readiness assessment and management. Other vendors have since followed with their own broad IPT management solutions, including Concord, Empirix, Integrated Research, and Micromuse. VoIP tools are available from some common network management vendors such as Brix Networks and NetScout. Of course, the IPT vendors themselves (e.g., Avaya, Cisco, Nortel, Siemens) also offer solutions that are usually specific to their own technologies. Most of these are point tools with useful but limited capabilities, though Cisco's IP Telephony Environment Monitor (built on the venerable InCharge technology from SMARTS) is much more comprehensive than the traditional element manager. Other vendors will introduce or expand products in this market, including major management vendors such as BMC, CA, HP, and IBM Tivoli.

Services are also on the rise. NetSolve offered one of the first notable services among independent management service providers (MSPs) in 2001. Others are following, including numerous offshore MSPs that now augment their management service portfolios with IPT. Telecommunications service providers (e.g., AT&T, MCI, Sprint, Verizon) offer VoIP services and are increasingly highlighting management services as value-added options. As public VoIP services grow, such adjunct services will mature and bifurcate into managed IPT services and standalone MSP services.

IPT poses new complexity levels beyond traditional management. A principal lesson to be learned from this complexity is that management consideration from the very conception of the service is imperative. Historically, technology deployments precede efforts to manage that technology by about two years. IPT is one of the first services to emerge where this postponement is ill-advised, because management is basic to telephony (e.g., call setup, voice mail). Most future services will share this characteristic, so IT organizations (ITOs) must change their approach or suffer the consequences of unreliable business services.

META Trend: During 2004/05, new infrastructure and application architectures (e.g., Web services, virtualization, utility computing) and budgetary restrictions will drive additional focus on capacity planning and meta-management efforts (e.g., status aggregation, business views), leading to more integrated meta-management tools (2007). Through 2006, continued cross-boundary management demands (e.g., organizational, informational, technical) will drive process, sourcing, and instrumentation changes.

Effective IPT management must have visibility into network elements, servers (e.g., call managers, VoIP-based application servers), endpoints (dedicated telephones and “soft” phones integrated into general-purpose computers as software), and application traffic flows. Because of this requirement, tools limited to just the VoIP traffic, though useful and often powerful for targeted needs, cannot span the full requirements of IPT (e.g., call servers, special features). IPT management solutions are aggregations of common management technologies. Accordingly, IPT is a service, not a pure technology silo issue (e.g., network server, application). This is one notable characteristic that makes IPT unique among IT services. Although the aggregation of all services is implied and accepted, IPT is a packaged solution that includes unique infrastructure (e.g., phones and call servers) and strictly requires appropriate QoS support within the network. No prior mainstream service had such attributes.

This exclusivity generates confusion about how to approach IPT management. It is viewed as either a radical new application or as yet another application to be plugged into a modular management architecture. In fact, it truly is a new application with special needs, and it also requires multiple management applications that plug into a modular architecture (i.e., IPT management tools are aggregations themselves). Such applications span traditional technology domains (e.g., networks, servers, endpoints) and closely correlate to operational process best practices such as the Information Technology Infrastructure Library and META Group’s operations excellence program. This correlation highlights the importance of such process models to effective operations. IPT management can be successful only when this process-oriented execution is applied. Indeed, such management tools embody the processes by automating process execution.

The first step to IPT management is to carry out performance assessments and capacity planning. This more accurately ensures that the IPT service will perform as expected and will point out any pitfalls that could scuttle the service’s success. After deployment, monitoring products measure service performance and availability. Diagnostic tools assist in the response phase of incident management and in problem management.

Performance monitoring is the most desired function in IPT management, because telephony engineers, operations staff, and end users have been sensitized to the service quality concerns of VoIP. The key metric for IPT voice quality is an end-user experience approximation value known as MOS (mean opinion score), ranging from 1 (unusable) to 5 (perfect — equal to traditional circuit-switched telephone service). This value is subjective, but vendors are attempting to calculate objective MOS values from underlying data. This is difficult because VoIP is UDP-based and lacks the natural performance visibility of TCP-based protocols. A new IETF standard called RTP Control Protocol Extended Reports (RTCP XR, RFC 3611) shows promise for more objective quality reporting, but users should not expect widespread support for RTCP XR in IPT hardware, software, and management tools until late 2005.

Other metrics for IPT include the performance and availability of calls and special features. Many of these metrics are collected from the IP PBX. Vendors with a history in server management have good capabilities to monitor such PBX servers. This is the very capability that led NetIQ (historically a popular Windows server management vendor) to release the earliest IPT management products (Cisco CallManager is a Windows server). Organizations should note that other full IPT management vendors have equivalent capabilities elsewhere in their product families. Ideally, some of these metrics should be available from the phones themselves, but instrumentation within IP phones is sporadic and non-standard where it exists at all.

Like any technology, configuration and change management are crucial to the success of IPT. A poorly configured service risks erratic voice quality and unreliable connections. Supporting infrastructure (e.g., telephones, network, call manager servers) is central to configuration. In addition to architecture and design issues, the attributes of the infrastructure exert heavy influence on service quality. Network QoS parameters are especially sensitive, and the daunting complexity of the myriad interacting components can be adequately controlled only by using configuration and change management technologies. The relationship matrixes and dynamic nature of this service are beyond comprehension by even the most skilled IPT engineers.

Bottom Line

Management of IP telephony services is a mandate to successful service deployment and one that must be included early in IPT service conception. Early inclusion fosters the required assessment of service feasibility and expected performance. IPT is a service that forces ITOs to adopt disciplined operational processes to avoid embarrassing service failure, more so than any prior service.

Business Impact: Proper control of new technologies minimizes risk and operational expenses.