



# Converged Communications Platform

## Version 7.0

December 2002

# Overview

Inter-Tel understands the value of long-term customer relationships. Development strategies of the past, present, and future revolve around technology migration and investment protection. Inter-Tel's ongoing commitment to new technology ensures that its customers' communications platforms will scale to meet their future needs.

In order for the Axxess Converged Communications Platform to be capable of evolving and protecting customer investments, it must be flexible enough to address the unknown requirements the future brings. This flexibility exists because Axxess is designed around an open model of communications. The track record of the platform's evolution demonstrates how truly open this platform is. Through the years, technology advancements within the industry have been elegantly integrated into the platform and into customers' environments. Some examples include Computer Telephony, transparent networking of systems, system growth, wireless end points, server-based telephony and now Voice over IP (IP Telephony) and IP convergence, to name a few.

Today, customers may select from a variety of IP, digital, analog and software-based end points in a large office or campus environment. If they need wireless access for those who are on the move, Inter-Tel can accommodate them. If they have telecommuters, work at home employees and traveling sales people, Inter-Tel can help them as well. Inter-Tel can network up to 63 systems, providing up to 40,000 ports, to seamlessly connect thousands of locations and employees over traditional and/or IP-based networks. These locations can be tied together with full-feature transparency, while leveraging the Internet.

With the release of Axxess version 7.0, Inter-Tel continues with its adoption of IP-centric solutions. The platform embraces convergence technology and implements it in a manner most suited for customer deployment. By implementing the highly disruptive technology changes found in IP convergence in a smooth manner, Inter-Tel's customers are not forced to change too rapidly, or give up tried and true capabilities just to gain benefit from newer advancements. Inter-Tel's customers are left in control of how and when to introduce change. This software updates the core platform to deliver the next level of Call Processing power. The focus for version 7.0 is IP telephony architecture and user/administrator feature enhancements as summarized below:

<u>IP Telephony</u>

- Transparent IP networking using the IP Resource Card (IPRC)
- Emergency dialing for remote IP phones
- Higher cabinet density for networking
- Support for standards-based gateways for remote trunks

<u>User/Administrative Enhancements</u>

- Music-on-Hold by device
- OAI enhancements for "tomorrow's" applications
- Enhanced emergency dialing
- New features for software integration

Version 7.0 delivers a low-cost IP networking solution for converged multi-site environments. This software enhancement allows Call Processing to handle IP trunks directly. This means that sites are able to network over IP using a networking version of the IP Resource Card (IPRC). When the new daughter card is added to the mix, a single card slot can handle 32 simultaneous IP calls to other Axxess systems.

For the remote office, the solution just got stronger. In addition to Inter-Tel's unique "plug and play" capabilities of the IP phones, remote workers have a solution for local calls and 911. Remote offices can now be equipped with a gateway that can plug directly into analog lines. Call Processing can use these lines as trunks in the system, and the remote workers can send/receive calls from their local area, including emergency calls.

As we look into the future, version 7.0 enhancements pave the way for powerful new applications using some new features in the Open Architecture Interface (OAI). From direct control of phone displays to superior call routing, such as hunting across PSTN lines, the OAI continues to become more powerful as time progresses.

Version 7.0 delivers the next evolutionary step in the migration of the communications platform. By bringing stronger support for new applications together with ongoing convergence of voice and data, Inter-Tel's solution continues to grow at the pace of business and technology.

## New Features

Transparent IP Networking Using the IP Resource Card (IPRC)

What's an IP Resource Card? The IP Resource Card is simply a Voice over IP gateway that slides into one of the multi-purpose card slots in Axxess' main system cabinet. It allows traditional communications to travel to and from the IP network. It comes in two configurations, each controlled through software, and each with flexible density, controlled by a license. One configuration is for connectivity of IP phones and IP gateways. The other configuration is for transparent networking.

So how is the IPRC used for networking? By placing networking software on the IPRC, Axxess version 7.0 systems can integrate together in a completely transparent manner, using the IP network. This is referred to as transparent IP networking. This advancement further enhances the distributed IP architecture already in place and makes networking with IP telephony a more integral expansion of the core system.

When the IPRC is used for transparent networking, the density options are controlled and upgraded with a software license. The density increments are four, eight and 16 channels on the base card. With version 7.0, support is also provided to increase channel density for transparent networking. By using a new daughter card for the IPRC, the channel capacity for transparent networking can be doubled, allowing either 24 or 32 channels (still using only one card slot in the cabinet). And, if an organization's communications needs were to change, the IPRC can be re-deployed in a different manner, simply by using different software and licensing. This flexible model secures and protects an organization's hardware investment.

The benefits of this enhancement to IP networking include:

- Lowers the cost of transparent networking, making it ideal for deployment of small remote phone systems
- Provides higher density transparent networking so less hardware is required for connectivity
- Simplifies administration since the programming is done through the main database programming application used for the rest of the system
- Future-proofs customers' investments by leveraging flexible hardware so functionality can change in the future

Support of Standards-based Gateways for Remote Trunks

In an IP-based model of communications, components of the system can be geographically dispersed. This means that a dedicated phone system may not be required at each location. Instead, IP phones can be deployed to remote locations and connected to the phone system over the IP data network. In order to give these remote phones access to phone lines in their local area, it is necessary to deploy a gateway in that facility that can communicate with both the phone system and the public switched telephone network (PSTN). To accomplish this, Axxess 7.0 uses a standard connectivity protocol known as the Media Gateway Control Protocol (MGCP).

MGCP is a protocol that allows IP telephony devices to establish a standard means of communication with each other. Axxess 7.0 uses MGCP to communicate directly with third-party IP gateways. When these gateways are placed on a customer's IP network, trunks can be added virtually anywhere. The gateways physically connect to analog lines from the phone company and link those lines to Call Processing over the IP network via the IPRC. IP phones can now be deployed at remote locations to give associates access to their local calling area for local calls and emergency dialing. Since Call Processing sees these gateways as trunks, administrators have the same call routing programming capabilities as traditional trunks, which provides other options, including the ability to share those lines with other users in the phone network.

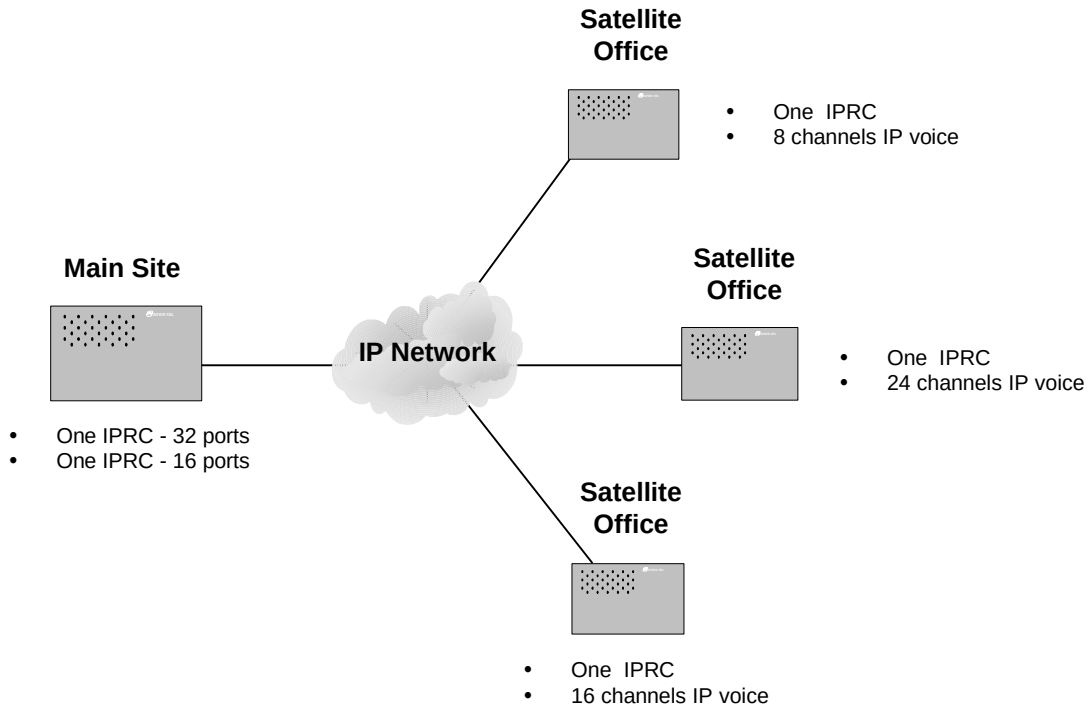
In addition to supporting remote trunks, MGCP gives the Axxess platform flexibility in tomorrow's environment. Support for open standards like MGCP is a logical step for this platform. While Axxess has always had an open applications model for the development of feature-rich applications both internally and through third-party developers, the connectivity between devices was not as flexible. With the help of standards, such as MGCP, the Axxess platform continues to migrate toward a more open and flexible

model than ever before. This helps to deliver a converged applications and transportation/connectivity model in a cohesive manner for greater power and performance in communications.

Sample Applications

*Example #1*
This example illustrates a basic layout of IPRCs and their respective port configurations. The main site needs to support more than the capacity of a single IPRC, so a second card is added. The IPRCs can be added as necessary to attain the required density at a given site. Next, the satellite offices are each given an IPRC with a port configuration most suited to that site's needs.

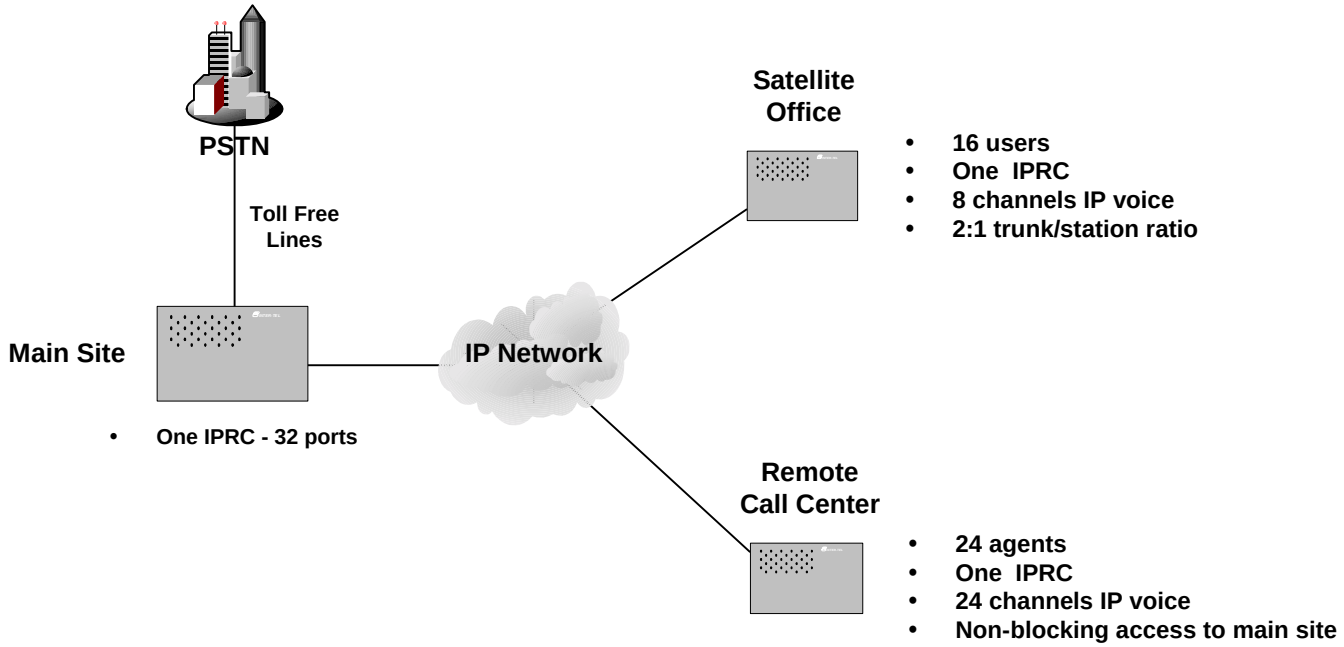
IPRCs use a point-to-multipoint architecture. This means that any IPRC can communicate directly to another, without relying on any other sites. This "full mesh" topology allows calls to travel directly from site to site. If any site were to become unavailable for any reason, the rest of the sites would remain fully operational, losing only the resources in the unavailable site. This mesh topology optimizes network call routing and allows for redundant paths.



*Example #2*
In this example, two different types of remote offices are represented. To start, the main site is the primary location for inbound/outbound calling for all the sites, and the organization's toll free phone numbers are routed to this site.

The first satellite office (top right) is more or less a normal site with normal traffic requirements. The necessary ratio of stations to trunks is 2:1. Since this site gets its trunks from the main location, the IP link between the sites must support the 2:1 ratio. For this reason, the site is equipped with eight channels of transparent networking to allow half the phones to be calling across the network at any given time.

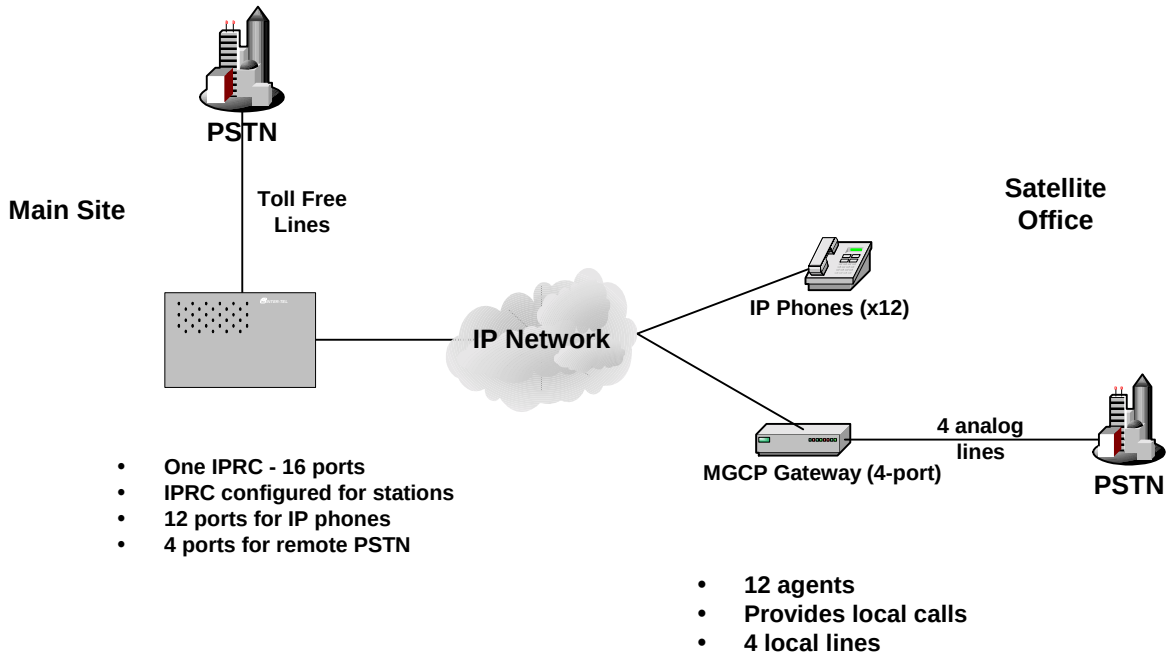
The other satellite office is actually a remote call center. The employees there are almost always on the phone, and require one outside line for every call center agent. To service these 24 agents, 24 networking channels are added to the site. By adding together the channel requirements of both the remote sites, a requirement of 32 channels for the main site becomes evident, so a fully populated IPRC is placed there.



*Example #3*
When an IPRC is configured to communicate with IP phones, it can also concurrently support MGCP gateways. This illustration demonstrates the basic layout of a remote office which has no local PBX. A data path is established between the two locations for connectivity. Since the remote site depends on the main site for connectivity, optional redundancy may be built into the network for improved fault tolerance.

The 12 users are each given an IP phone. The phones are controlled by the main site, so no extra telephony equipment is needed at the remote site to get the extensions operational. Once those extensions are operational, they will need access to the local calling area for emergency dialing and normal local calls, so a gateway is placed there to do the job. This gateway connects to local phone lines in the remote area and sends calls to and from the main site, as if the trunks were physically located at the main site. Both the phones and the gateway communicate with the same type of IPRC. Since the total port count (12 stations and four lines) of the remote office is only 16, a single IPRC at the main site can service this location.

If the site were larger or if there were several more sites, IPRCs could be deployed on an as-needed basis at the main site, and the stations and gateway ports could be controlled by any of the IPRCs the administrator chooses to use. Additionally, more gateways can be deployed to support the required number of lines for a given calling area. Some businesses may even consider placing an MGCP gateway into a local area where the business routinely sends or receives calls, even if they do not have an office there. This is called a POP (Point Of Presence) and is a way for businesses to expand their calling reach without using public telephone lines for long distance calling. This is particularly beneficial in certain international applications.



Emergency Dialing for Remote IP Phones

Version 7.0 introduces a new feature called *Emergency Outgoing Access*, which allows administrators the ability to program emergency call routing on a per-station/device basis—instead of system-wide. In previous PBX designs, it was certain that the stations and trunks in the system were located together in the same physical location. Now, IP technology has changed that. Rather than identifying a particular trunk or trunk group for all system users to use for emergency dialing, Axxess 7.0 allows the administrator to define emergency dialing instruction on a per-station basis. Since IP phones can be in locations where the phone system is not, it is necessary to be able to identify different paths for emergency calling. This feature leverages the standards-based gateway solution to allow trunks to be placed together with phones in remote locations.

Music-on-Hold by Destination

In previous versions, the Axxess system determined the music source a caller heard when on hold, based on the trunk group on which the call came in. The system now allows more programming flexibility by enabling the music source a caller hears to be determined by the destination for which the caller is waiting. Unique Music-on-Hold options are available for the following destinations:

- ☑ CO Trunk Groups (groups of phone lines from the local phone company)
- ☑ Hunt Groups (groups of users who take similar calls such as call centers)
- ☑ Nodes (individual phone systems within a networked environment)
- ☑ Route Groups (logical grouping of call routing characteristics)
- ☑ Stations (actual end users of the phone system)
- ☑ Voice Processor Applications (interactive menus, fax back services, voice mail, etc.)

For each of these destination types, businesses can decide what the caller should hear, including:

- ☑ Music Source (any standard audio source providing music, custom messages, etc.)
- ☑ Ring Back (to provide standard ringing so the user understands that the call is waiting to be answered)
- ☑ Tick Tone (to provide a basic “tick” every few seconds so callers know they are still connected and waiting)
- ☑ Silence (for situations when callers should not hear anything at all while they wait)

Other Software Enhancements and Changes

*Swap Station*

The Swap Station feature is a very handy utility made to simplify relocation of people from desk to desk. It allows a system administrator to use an administrator’s phone or Information Control Center v3.0 or later (aka Attendant Console) to swap (relocate) two extensions. It is no longer necessary to reprogram extensions or rewire just to move users around. While IP phones are inherently mobile, this feature addresses the traditional phones so the whole environment can become more flexible. Anyone with administrative privileges can easily move people around because the utility is so simple, it does not require specialized knowledge of the system.

*CT Gateway 3.0*

The CT Gateway is an application that works with the Open Architecture Interface (OAI) of the Axxess platform. Each Axxess system has its own OAI link for integrated applications built by both Inter-Tel and third-party developers. Quite often, customers wish to deploy a single instance of an integrated application to service a network of Axxess phone systems. This is where the CT Gateway comes in. It brings together the OAI link from each system and creates a single unified interface for the integrated applications to use.

When applications need to integrate in a multi-site 7.0 network, they will need to use the latest version of the CT Gateway, version 3.0. CT Gateway 3.0 is designed to support the OAI changes found in Axxess version 7.0. In addition to supporting version 7.0, CT Gateway 3.0 has a few new features as well. It now enables compressed (zip) log files to save disk space and ensures the correct information is available when sending files to Inter-Tel for troubleshooting purposes. CT Gateway v3.0 also supports new System OAI features and the Swap Station feature, as well as provides enhanced performance.

*Information Control Center*
Axxess version 7.0 is compatible with Information Control Center v3.0 (or later) software. Inter-Tel's Information Control Center provides seamless integration between the computer and telephone so users can immediately determine real-time station status of associates—allowing efficient call processing via touch screen, mouse or keyboard. Information Control Center works in both single- and multi-node configurations, so users can view the status of all the stations and hunt groups on the system whether they're in the office or across the country.

## Summary

Inter-Tel is committed to adopting and nurturing new technologies. As new and unforeseeable developments emerge, Inter-Tel will seek to embrace that which is valuable to its customers and that which truly offers an enhancement to the way they communicate and do business. Inter-Tel's commitment to its customers will continue to remain steady in an ever-changing environment.