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April 10, 1996

Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W., Room 222  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

RE: Ex Parte Presentation  
CC Docket No. 91-346 Intelligent Networks  
CC Docket No. 95-116 Number Portability

Dear Mr. Caton:

On Wednesday, April 10, 1996, Karen Weis, Julie Ladieu-Walton and I met with Rose Crellin, Jason Karp, Debra Harper, Susan McMaster and Rob Tanner of the FCC Policy & Program Planning Division, in connection with the above-captioned dockets. The attached material was used as the basis of our discussion.

Two copies of this Notice are being submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(2) of the Commission's rules.

Sincerely,

*Betsy J. Brady*

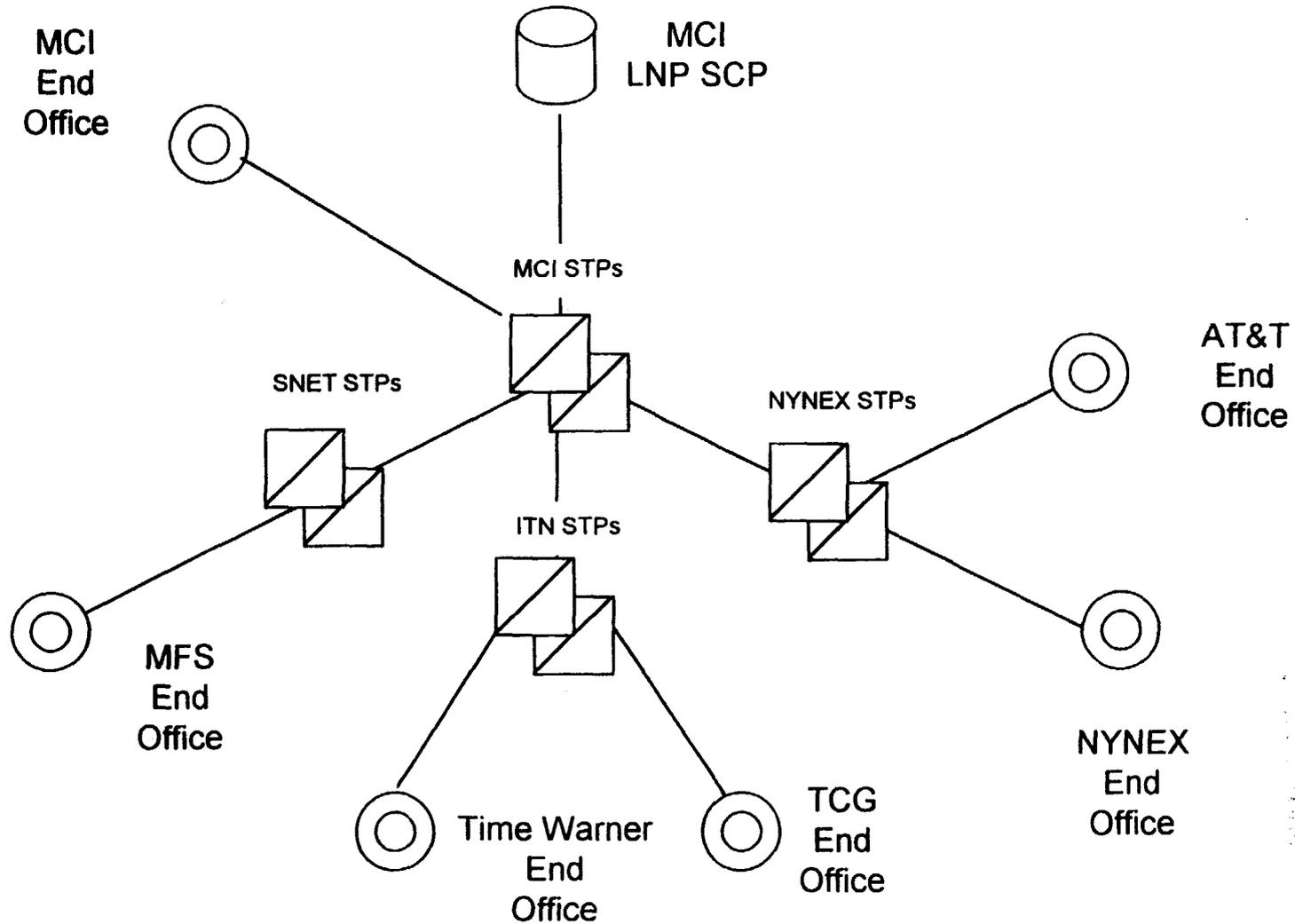
**Attachments**

- cc: R. Crellin
- D. Harper
- J. Karp
- S. McMaster
- R. Tanner

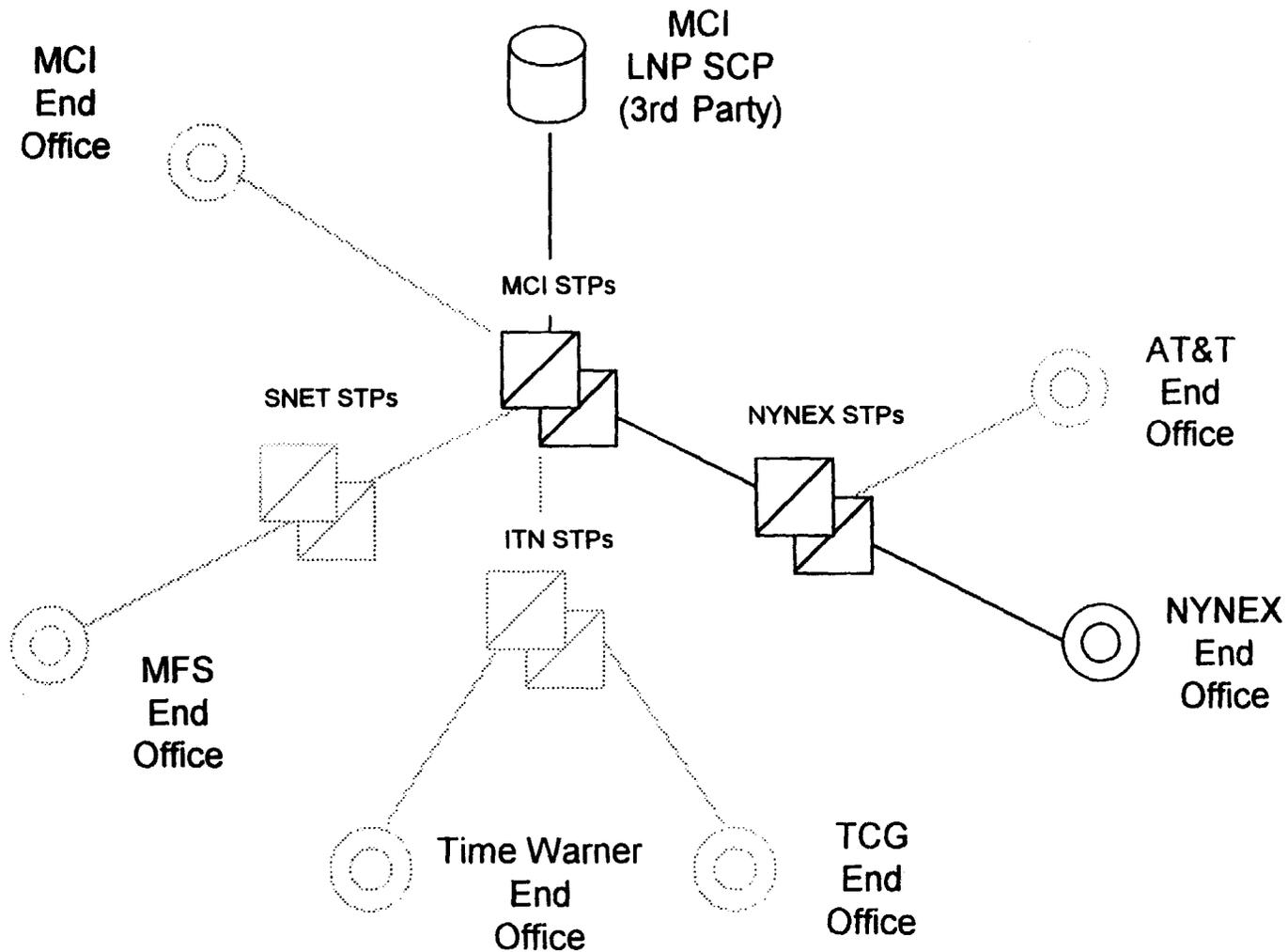
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# Manhattan CPC Trial Architecture - Phase 1

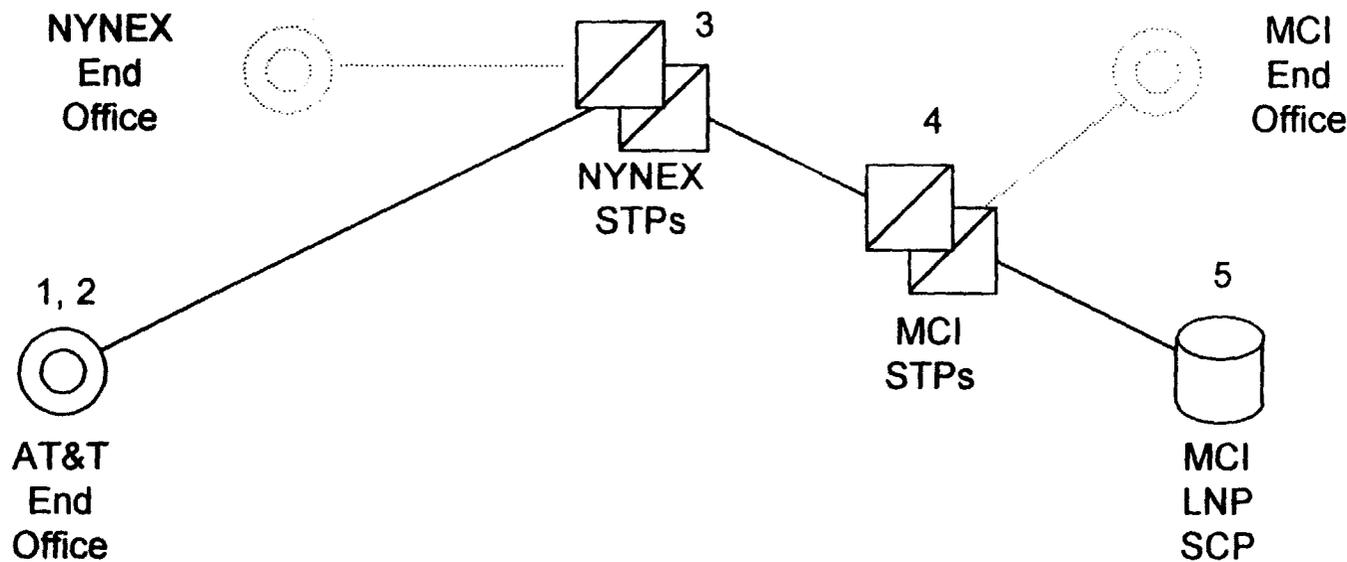
*Using Interconnected SS7 Networks and an MCI LNP SCP*



# LNP Application of 3rd Party AIN SCP



# Basic LNP Query Signaling Flow Manhattan CPC Trial



- ① Local subscriber at the AT&T end office dials NXX-XXXX (local call)
- ② AT&T local end office sends a query to a NYNEX STP with the LNP translation type and NPA-NXX-XXXX as global title address
- ③ NYNEX STP translates 6 digits of the global title address, derives a point code corresponding to the MCI STPs, and sends the message to an MCI STP
- ④ MCI STP translates 10 digits of the global title address, derives the point code and subsystem number of an MCI LNP database, and sends the message to the MCI LNP database
- ⑤ MCI LNP database sends a response message to the AT&T end office via an MCI STP and a NYNEX STP using the return address contained in the initial message

## AT&T Proposal for Mediated Interconnection of LEC and 3rd Party IN Platforms

Mediation Function	Issue Definition	Resolution
Routing	How can AIN queries/responses be correctly routed to/from multiple SCP providers offering competing IN-based services?	Assign single translation type (TT) per SCP provider with TT-dependent GTT. Refer to item 3 in [1] and section 5.3 in [2].
Protocol Interworking	How can SS7 messages be exchanged between networks of competing service providers?	Existing SS7 protocol specifications (both ISUP and TCAP) allow for internetwork exchange of messages, assuming both networks are compliant with the standard. Refer to item 4 in [1].
Protocol Message Screening	What application screening of messages and parameters is required to allow third party access?	All parties must certify compliance to the same protocol standard with rigorously defined message sets and allowed parameters. Refer to items 3, 4 and 11 in [1].
Recording/Billing	How will signaling traffic usage be measured and recorded for purposes of billing third party service providers?	Technology exists to measure third-party usage of SS7 networks. Refer to Ameritech Part 69 Waiver to Establish Unbundled Rate Elements for SS7 Signaling.
Security	How can physical and logical security of the CCS network and service applications be maintained with third party access to AIN?	Security is ensured through, certified SS7 network interconnection, certified third party IN SCPs, and tested service applications plus use of all inherent network interconnect and application screening. Refer to items 3, 4, 10, and 12 in [1] and section 5.3 in [2].
Network Management	How can dynamic call gapping controls be implemented across interconnecting networks?	Use of single translation type per IN SCP provider permits call gapping without affecting other providers' calls. Refer to item 7 in [1] and section 5.3 in [2].
Performance Management	How can network performance (e.g. link/node status, traffic management) be monitored and managed across interconnecting networks?	SCP providers shall use industry-proven interconnection standards, along with application screening to ensure adequate performance management. Refer to item 4 and 5 in [1].
Fault Management	How are network troubles detected, isolated and repaired in across interconnecting networks?	Performance Management as described above and cooperative inter-carrier operational processes are required. Refer to item 4 and 21 in [1].
Feature Interaction	How will undesirable feature interactions be identified and resolved in an environment allowing third party access?	Joint certification and testing efforts will be needed. "[T]rigger interaction difficulties will be addressed during the feature provisioning process." Refer to item 12 in [1], section 5.3 in [2], and BellSouth Part 69 Waiver request.

### References

- [1] "AT&T Responses to LEC Network Concerns," April, 1996  
 [2] "AT&T Integrated Test Network-BellSouth AIN Test Laboratory, AIN Interconnectivity Test Report," November 1995

## Responses to LEC Network Concerns

The following information addresses the LEC-expressed network concerns associated with Intelligent Network (IN) LEC-third party service provider interconnection.

LEC Identified Network Harm	Remarks	Reference
<p>1. "AT&amp;T's proposal also ignores consumer impacts that could result from introducing IN services that have the potential to conflict with existing switch-based services."—GTE Ex Parte 9/15/95</p>	<p>Trigger interaction conflicts are prevented by end office provisioning, where certain combinations of triggers and features are automatically prohibited from being provisioned. Positive and negative interactions can occur. These interactions can occur in any environment (even when the LEC designs its own services). Joint certification testing efforts between the LECs and the third party IN service providers will be important to identify feature interactions, just as it is in the LEC-only IN environment.</p> <p>An example of an allowable IN-based feature interacting with a switch-based feature follows. Suppose the service provider wants to deploy an SCP-based Single Number Reach Service (SNR), which allows a customer to dial a number and reach the nearest store location. The SNR service requires that a Terminating Attempt Trigger (TAT) trigger be assigned to the number of the SNR subscriber. When caller A originates a call to the SNR subscriber, the SNR subscriber's switch (terminating) recognizes the TAT trigger, suspends call processing and sends a query to the SCP. Service logic in the SCP determines how to route the call, based upon Calling Party Number and the Dialed Address Digits to the nearest store location.</p> <p>Now suppose Subscriber B (SNR subscriber) also has the Call Waiting Terminating (CWT) feature (CWT uses a tone to inform a busy station user that another call is waiting) and a TAT trigger assigned (as a result of the SNR service). A line associated with a TAT trigger can have CWT assigned. For calls terminating on this line, the SCP is queried before the CWT feature activation takes place. If the SCP returns the route to the same line and the line is busy, a call waiting tone is provided to the line and audible ringing is heard by the caller. If, instead, the SCP returns a forward to number and call waiting also exists on that new line, a call waiting tone is provided if the line is found to be busy.</p> <p>Any negative feature interactions which may occur apply equally to the LEC. For example automatic call back/recall is disabled when an IN trigger is encountered.</p>	<p>3, 4</p>
<p>2. "Consumers will be required to choose between subscribing to a new IN service or maintaining their existing switch-based services." GTE Ex Parte 9/15/95</p>	<p>IN features can interact with switch-based. It is within the control of the service provider(s) to create offerings which do not allow conflicting services, where service providers wish to offer both IN and switch-based services to customers. Any interactions would be identified and resolved through joint testing efforts before the service is offered to the public. To minimize interaction possibilities using the current IN implementation, the preferred case is to have a single SCP provider per line for all triggers. This method still allows multiple third party IN service providers to use the</p>	<p>3, 4</p>

	<p>SCP via SMS access. A LEC may offer switch based features at the same time a third party IN service provider offers IN based services. Some interaction constraints are known currently. For example, call waiting as a switch-based feature may interact with IN-based features, however, automatic recall as a switch based feature may not function in the presence of IN-based features.</p> <p>IN call processing can be described in terms of a call state model for originating and terminating capabilities. Generally, originating features (Calling Party is the subscriber) are implemented via originating triggers and terminating features (Called Party is the subscriber) are implemented via terminating triggers. Trigger precedence is defined based upon the progression of the call state model (i.e., Off-hook Immediate, Off-hook Delay, Feature Code Dialing, 3/6/10, N11, TAT) and whether originating or terminating features are subscribed. Refer to Table 1 for trigger assignments.</p> <p>While there may be some cases where users may have to choose between IN and switch-based features, it is within the control of the service provider, through joint efforts with the LEC, to identify, test and certify these cases prior to service introduction. Indeed, customers may have to choose between IN based and switch-based services during customer provisioning, just as they do when offered conflicting services by the LEC.</p>	
<p>3. "AT&amp;T's claim that direct access to triggers can occur today without mediation is seriously flawed. AT&amp;T claims that mediation functions already exist in the network to ensure network reliability and integrity. GTE agrees that the following mediation functions are contained in Gateway STPs:</p> <ul style="list-style-type: none"> <li>• origination &amp; terminating point codes</li> <li>• routing functions such as GTT based on TT, subsystem # assignments &amp; allowed Calling Party Address &amp; Called Party Address"</li> </ul> <p>GTE Ex Parte 9/15/95</p>	<p>Basic screening and routing have already been defined for a service provider's SCP to interface to a LEC SSP. These are defined in two network interface specifications from Bellcore (1) and (2). The parameters that decide message routing are:</p> <ul style="list-style-type: none"> <li>• Originating Point Code (OPC) and Destination Point Code (DPC)</li> <li>• SCCP Calling Party Address and Called Party Address <ul style="list-style-type: none"> <li>- TT and GTA</li> </ul> </li> </ul> <p>At each level of translation and message routing the STPs will check address format and content and discard any messages with invalid addresses. An SSP will populate the SCCP Calling Party Address in a query with its own Point Code (PC) and Subsystem Number (SSN). The SCCP Called Party Address will be populated with a Translation Type (TT) and Global Title Address (GTA) - usually the Dialed Number. STPs perform TT-dependent Global Title Translations (GTT) on the GTA to derive the PC and SSN of the SCP to which the query should be routed. After applying call logic, the SCP will return a response to the SSP, using the SSP PC/SSN received in the query as SCCP Called Party Address and its own PC/SSN as SCCP Calling Party Address. If at any point the SSP, STP or SCP detects an invalid address format or an unrecognized address value a routing failure occurs and the message is discarded and terminated. The call is then given announcement treatment.</p> <p>Under this scenario, each SCP provider is assigned a separate TT, with the number of SCP providers limited to the number of available TTs. There are a total of 220</p>	<p>1, 2</p>

	<p>intranetwork applications TTs. Some of these are already being used by LECs and IXC's. Not including these spare TTs, there are 30 intranetwork applications TTs available. This method allows LECs to route queries to multiple IN service providers, requires no development, and helps prevent ACG by one provider causing other providers' calls to be affected. If the SCP goes into overload, it sends an ACG message to the switch. Since the TT indicates that particular SCP provider, other service providers in the same NPA-NXX cannot be impacted.</p>	
<p>4. "These existing Gateway STP mediation functions do not provide any level of screening related to IN messages once advanced IN translation types or subsystem numbers are allowed." GTE Ex Parte 9/15/95</p>	<p>Currently, the SS7 messages passed between LECs and IXC's are being screened. For example the switch can check for such conditions as response timer expiration, unexpected messages, unexpected message sequences, unexpected parameter sequences, erroneous data values, missing parameters, invalid AMA parameters, query failures, carrier type mismatches and many others. The SCP can detect and report errors as well. Errors detected by an SCP include subscriber records not found, subscriber data inconsistency, IN application errors, SSP communication failures and outgoing TCAP message failure. The STP has the capability to perform error detection at the link level (e.g. to detect transmission errors), basic error correction at the link level through retransmission, signaling traffic management to divert traffic from congested areas, signaling link management to restore failed links, signaling route management to convey network status, notification of subsystem failure through Subsystem-Prohibited message, and transmittal of Subsystem-Out-of-Service Request to allow a subsystem to go out of service without degrading network performance.</p>	4
<p>5. "In a pre-AIN environment, all message types and parameters are explicitly defined within the switching points with interactions well defined. In an AIN environment, generic capabilities are introduced which require a new level of mediation." GTE Ex Parte 9/15/95</p>	<p>In the post-IN environment, all message types and parameters are defined within the switching points as well. If an unrecognized message type or parameter is received the switch will not process it. Therefore, application screening does exist at an SSP and SCP. Refer to item 4.</p>	4
<p>6. "...examples illustrate the undesirable interactions that could occur.. Interactions between switch-based CLASS services and AIN third party access must be resolved."</p> <p>"If the SCP service logic returns a different CPN than received from the original caller and the call subsequently is terminated to a CLASS consumer who subscribes to Automatic Recall (AR) and who has this feature activated, the network would attempt to return the call to the wrong caller."</p> <p>"Even if the CPN number is not changed, there is the opportunity to modify the "Privacy" indicator associated with the CPN number. The third party IN</p>	<p>The switch overwrites the existing Calling Party ID with the new one it receives in a response message from an SCP. The new Calling Party ID is used in signaling, but is not used in creating any SSP AMA records. Although the switch could be developed to screen on Calling Party ID or other changed parameters it receives from an SCP, such development would counter the intent of the AIN specification and call model by placing service control logic back in a switch. Rigorous testing and robust provisioning processes are the appropriate means to address the issue. See discussion on feature interactions in item 2.</p> <p>Privacy could potentially be modified by an SCP. It could also be modified by switches in ISUP signaling, which conveys a privacy indicator and CPN. The overriding point in the case of privacy changes is that FCC rules (para. 64.1601) indicate that no common carrier subscribing to or offering any service that delivers calling party number may override the privacy indicator associated with an interstate call.</p>	3, 4, 5

<p>service could change the call originators CPN "Privacy" indicator from "Private" to "Presentation Allowed." GTE Ex Parte 9/15/95</p>		
<p>7. "If multiple AIN service providers have access to the SSP triggers and if one of the third party's SCPs were to go into an overload condition and activate ACG controls, the control is applied to the entire SSP office. All AIN service providers' services are impacted." GTE Ex Parte 9/15/95</p>	<p>When all third party SCP providers share the same TT, an ACG control may affect other SCPs. An ACG control uses the TT and the first 6 digits of the GTA to control the number of messages sent from the SSP to the SCP. If a single TT is used, any GTA with the same first 6 digits will be affected. If one TT is assigned to each third party SCP provider, this is not an issue since each TT will be unique, allowing independent controls for each SCP provider. Additional controls exist with the SCP Overload Control (SOC) and the SMS Originated Code Controls (SOCC) allowing a workcenter to manually or automatically adapt the ACG controls depending upon the query processing time, SSN and other parameters (e.g., impose 10 digit controls).</p>	3
<p>8. "...the third party's SCP can control the trigger activation/deactivation for any subscribed trigger in the SSP independent of the service provider assigned the trigger. If multiple third parties have trigger access, one third party could activate/deactivate the triggers associated with another third party's service." GTE Ex Parte 9/15/95</p>	<p>Triggers are provisioned by the LEC at the switch. A third party IN service provider would send a service order request to a LEC, and the LEC would, in turn, provision the triggers on the customer's line at the switch on behalf of the third party service provider. Since SSP queries will be segregated amongst SCP providers by TT and queries and responses are precisely correlated via transaction identifiers, an SCP provider will only be able to activate/deactivate triggers on lines subscribed to it. Since the AIN specification does not currently allow for the SCP to send autonomous messages to the SSP, an SCP provider could only activate/deactivate a trigger on lines that already have some trigger provisioned (by the LEC) such that queries are being sent to their SCP.</p>	3, 4
<p>9. "...there are major billing related issues that must be addressed. ....In addition, the AIN service can control the "Charge Number" used for billing purposes (equivalent to ANI in an AIN/SS7 environment). With third party AIN access, the third party has direct control of the Charge Number." GTE Ex Parte 9/15/95</p>	<p>The SCP can potentially change the Charge Number. This flexibility exists in IN to allow the creation and offering of billing number services to customers. For example, a selective collect call acceptance service would allow a subscriber to choose the callers from whom to accept calls. The switch overwrites the existing Charge Number for the call with the value it receives from the SCP in a response message. The new Charge Number is used in signaling, but is not used in creating any SSP AMA records. ISUP signaling, used to signal between switches today, also conveys Charge Number information which switches along the way could potentially change.</p>	3
<p>10. "A report of US Government's National Communications System, demonstrates that AT&amp;T's allegations that AIN mediation is unnecessary are incorrect. Security is a major concern. However, the addition of third-party SCPs to the network has the potential to open up the network to a host of new security problems that will directly affect the integrity of the network." Bell Atlantic Ex Parte 10/27/95</p>	<p>This report addresses recommendations to the Office of the Manager, National Communications System, regarding use of AIN in the delivery of National Security and Emergency Preparedness telecommunication services. While acknowledging security vulnerabilities that must be addressed, the report also acknowledges that "...whether the opening of the networks comes about by federal decree, by state rules, or by independent action from the major service providers, access by third parties will, in the end, be the rule." That being the case, the security vulnerabilities must be addressed and the report goes on to state advantages of an OMNCS-owned and operated SCP, essentially making the OMNCS a third party (e.g. "Tighter control over the execution environment"; "Control over the physical security of the installation and the SCP"; "Potentially greater control over the design and construction of the SCP")</p>	3, 4
<p>11. " By claiming that only minimal mediation</p>	<p>While it is true that STPs do not screen TCAP messages, SSPs and SCPs do perform</p>	

<p>functions are required to provide third party access to AIN, AT&amp;T trivializes the complexities required to implement multiple service providers' access to AIN under any scenario...For example, current network elements such as STPs and SSPs do not have the capability to perform the needed mediation functions. STPs have no capability to screen TCAP messages, which are key to the functioning of the AIN."</p> <p>Bell Atlantic Ex Parte 10/27/95</p>	<p>application screening of TCAP messages. This TCAP screening in conjunction with the link and connection level screening performed by the STPs provides robust mediation capabilities using the existing deployed technology. Refer to Item 4.</p>	
<p>12. "The security, feature interaction management &amp; provisioning system development required to facilitate a safe and effective access system for a software driven network, which includes AIN, is a major undertaking." Bell Atlantic Ex Parte 10/27/95.</p>	<p>BellSouth proposes, in its Part 69 waiver request, that "trigger interaction difficulties, including those involving current service offerings, will be addressed during the feature provisioning process."</p>	
<p>13. "Certification can be effective only for non-real time mediation, however, real-time mediation is also required for AIN security and reliability safeguards." Bell Atlantic Ex Parte 10/27/95</p>	<p>The identification of additional real time mediation, over and beyond that already in place in IN network elements has not been defined.</p>	
<p>14. "AT&amp;T's service certification proposal would entail separate certification of each service to run on the LEC network." Bell Atlantic Ex Parte 10/27/95</p>	<p>IN based-services run independently and with existing switch-based services. If new services are purchased by customers, feature interaction must be tested. The same is true for any new service, which requires that a rigorous certification process be followed to include the following:</p> <ul style="list-style-type: none"> <li>• Internal third party service testing</li> <li>• SS7 interconnection certification testing with LEC</li> <li>• IN certification testing with LEC</li> </ul>	4
<p>15. "AT&amp;T inconsistently states that Phase II, which provides a consumer a choice between the LEC or an alternative third party service provider as the single provider of line-side AIN features does not require mediation." Bell Atlantic Ex Parte 10/27/95</p>	<p>AT&amp;T's position is that all phases require mediation. Mediation functions exist today in the area of SS7 signaling at the SSP, STP and SCP. Other areas of mediation to cover network management, security, performance, provisioning, and screening are also sufficient assuming certain constraints (e.g., one TT per SCP provider). Existing mediation functions do not need to be moved to a single new network element for phase 2.</p>	3, 4
<p>16. "Off Hook Immediate</p> <ul style="list-style-type: none"> <li>• 911, operator services, 10xxx dialing, presubscription, may not work"</li> </ul> <p>Pacific Telesis Ex Parte 9/29/95</p>	<p>911, operator services and other call types are defined within IN through the use of serial triggering. Due diligence in joint negotiation, testing and provisioning between the third party IN service providers and the LECs will be necessary to ensure these scenarios function properly. Refer to Item 24.</p>	
<p>17. "Off Hook Delay</p> <ul style="list-style-type: none"> <li>• Local network cannot guarantee end user access to operator services and carrier override (10xxx)"</li> </ul>	<p>Refer to Item 16.</p>	3, 4

Pacific Telesis Ex Parte 9/29/95		
18. "The attached diagram from AT&T's April 20th Ex Parte illustrates how end office trigger access can adversely affect end user expectations and other providers' services." Pacific Telesis Ex Parte 9/29/95	<p>Office based triggers can be used in accordance with the call state model which determines when triggers can be encountered in a call progression. Triggers may be encountered in a subsequent or serial fashion as implemented in the SSP by the switch vendor. The sequence cannot be altered by the third party SCP provider</p> <p>Also, the LEC has the final control on trigger activation since it provisions the trigger upon receipt of a service order request from a third party IN service provider. If a LEC suspects that a third party IN service provider is causing problems, they can de-provision the trigger(s) or the routing translations for that particular TT.</p> <p>Joint certification processes and agreements between IN service providers and LECs are necessary to ensure interoperability. Refer to item 2.</p>	3, 4
19. "In effect, the scenarios described and advocated by AT&T would limit the end user to one service provider for local, long distance, and feature services, such as CLASS services." Pacific Telesis Ex Parte 9/29/95	<p>The customer is not restricted to a single provider. The recommended approach is to have a single SCP provider per line as the near term arrangement. Customers will still have a choice of local and long distance providers independent of IN service provider. In addition, each SCP provider will be able to support multiple IN service providers within their SCE/SMS in the same manner proposed by BellSouth in its Part 69 waiver request. This allows the customer to obtain service from any and all IN service providers utilizing the same SCP provider. Service interaction with existing switch-based features provided through the LEC may occur. This means that for a given customer, there is a choice of subscribing to services provided by either the LEC, the third party or both service providers. For example, a residential customer can have call waiting from an existing LEC and, at the same time, have selective call forwarding from a third party service provider. In this case, the two service providers will have to negotiate and agree on the call flow for the customer. Any feature interaction scenarios should be discovered and resolved through joint certification and testing efforts.</p>	3, 4
20. "...AT&T is arguing for unfettered, unrestricted access to the operating software embedded in LEC switches that decides how a call is to be processed (i.e., switch triggers)." SBC Ex Parte Amended 1/17/96.	<p>AT&amp;T proposes that the Third Party SCP be connected to a Third Party SS7 signaling network, not connected directly to the LEC network.</p> <ul style="list-style-type: none"> <li>• LEC and third party embark on specially designed hardware &amp; software certification program for third party SCP</li> <li>• LEC &amp; third party engage in service application testing</li> <li>• LEC accesses own software upon receiving a service order from Third Party</li> <li>• LEC initiates internal work order</li> </ul>	
21. "Undiscovered or left unresolved, (those) problems would harm SWBT's public switched network and negatively affect not only the AIN-subscribing customer, but other customers as well." SBC Ex Parte Amended 1/17/96.	<p>All problems will have to be resolved cooperatively through joint agreements and testing.</p> <p>Through the assignment of a TT to each SCP provider, the issue of affecting other customers' calls is eliminated. If the SCP goes into overload, it sends an ACG</p>	

	message to the switch. Since the TT indicates that particular SCP provider in the routing, other service providers calls cannot be impacted.	
22. "Current AIN technology allows SCP service logic to direct a switch to complete calls to IXCs. The SCP need only return a valid CIC to the switch, and the call completes to the associated IXC. At present, there is no existing AIN capability that would prevent an AIN provider from redirecting all calls (local, intraLATA, interLATA) to a carrier of the provider's choice." SBC Ex Parte Amended 1/17/96.	The presence of Carrier parameters is interpreted by the switch as a request for public routing. The Primary Carrier parameter, if present, indicates the carrier to be used for the call (in an Analyze_Route message). Different LECs may use different Carrier values, so SPAs may need a table mapping SSP PC to LEC Carrier ID. If the carrier type does not match the call type, then the switch initiates fault handling. For example, if an IXC is not authorized to handle local calls, then the switch will go to fault handling if an IXC carrier code is returned by an SCP for a local call. The absence of Carrier and trunk group parameters is interpreted by the SSP as a request for autonomous carrier selection, which is done based on digit analysis of the called party parameters, therefore a local call (e.g. 7 digits) is handled by the local carrier.	3, 4
23. "Unmediated access to SSP switch triggers could negatively affect billing for AIN services. At present, several switch triggers require that billing information be returned from SCP service logic in order for an AMA billing record to be generated. An AIN provider could eliminate this information from a response, resulting in the local carrier's inability to bill correctly. Not only could the originating LEC lose access revenues, an AIN provider might cause the billing information to be lost on calls that are routed to its competitors." SBC Ex Parte Amended 1/17/96.	True, an IN service provider can modify the information contained in certain messages since the SCP has the flexibility of changing some fields in the response messages it returns to the SSP. The capability to change billing parameters is built into IN to permit service providers to offer different flexible billing arrangements to customers (e.g. selective reverse billing based on calling party number). In addition, ISUP signaling conveys billing information which switches along the way could potentially change independently of IN capabilities.  Joint service agreements/contracts between IN service providers and LECs will be necessary to ensure proper service functioning. In particular, testing is required to ensure billing is done properly.	3, 4
24. "When an AIN trigger is invoked, that trigger takes priority over many switch-based functions, including E911 emergency calls and operator calls....In order for essential services such as E911 or Operator Assisted calls to continue to work universally, the AIN service providers must insure that their service continue to allow such feature interactions. Mediation would provide this assurance." SBC Ex Parte Amended 1/17/96.	SSP digit analysis tables allow for certain call types (e.g. 0+/0-) and certain dialing sequences (e.g. 911) to be provisioned as escape codes which pre-empt AIN triggers. It is likely that LECs offering IN-based services today already have such provisioning in place and third party IN service providers will not be able to modify it.	
25. "At present, switch vendors do not uniformly support all trigger types, classes of service, and AIN releases." SBC Ex Parte Amended 1/17/96	Agree. This fact was determined in the AT&T/BellSouth test. The result is that some services would not be available in all geographies. This issue is no different for a LEC with its own heterogeneous network.	
26. "AT&T further alleges that to implement mediation, new mediation devices will need to be added to the network...thereby increasing the cost of mediation....mediation functions/requirements have not been defined by the industry. Therefore, it	AT&T's position is that a new mediation device is <i>not</i> needed.  Any additional mediation functions and requirements should be identified so as to clearly address the need. New mediation functions should make use of the existing IN network elements (SSPs, SCPs, STPs).	

<p>is premature to assume that new devices will be required." SBC Ex Parte Amended 1/17/96.</p>		
<p>27. "The Off Hook Delay trigger is 'hit' after the end user has gone off hook and has dialed his digits. With current technology, the LEC has the ability to load specific dialed digit strings that circumvent the local switch from initiating the AIN query to the IN service provider's SCP. (...) However, services such as 800/8XX service cannot be supported since all of the possible 800/8XX numbers would have to be delineated in the local switch's tables. Current technology is severely limited in its ability to perform the required 'positive screen,' e.g., cannot screen 800-XXX-XXXX" SBC Ex Parte 02/21/96</p>	<p>The OHD trigger will be "hit" for 800/8XX calls dialed from a subscriber line with that trigger provisioned. However, before a query is launched the SSP will perform digit analysis on the dialed digits. The LEC may provision data in the digit analysis tables such that incoming digits 800/8XX can be defined as an escape code. This will preempt the query to an SCP and instead result in a query to an 800 database. Refer to item 24.</p> <p>Certification testing is needed to ensure proper functioning of features/triggers which interact.</p>	

**Table 1. Trigger Assignment Interactions**

Trigger	OHI	OHD	CDP	FCD	3/6/10	TAT
OHI	X	X	X	X	YES	YES
OHD	X	X	YES	YES	YES	YES
CDP	X	YES	X	YES	YES	YES
FCD	X	YES	YES	X	YES	YES
3/6/10	YES	YES	YES	YES	X	YES
TAT	YES	YES	YES	YES	YES	X

X indicates the set of triggers that may not be assigned together per [3].

**Table 2. Trigger Checkpoints**

Call State	Trigger
Idle	
Off-hook	Off-hook Immediate
Digit Collection	Off-hook Delay Private EAMF Trunk Shared Interoffice Trunk
Digit Analysis	3/6/10 N11 Feature Code Dialing Plan Custom Dialing Plan
Routing	Automatic Route Selection (ARS) Automatic Alternate Routing
Ringling	
Termination	Termination Attempt Trigger
Take Down	

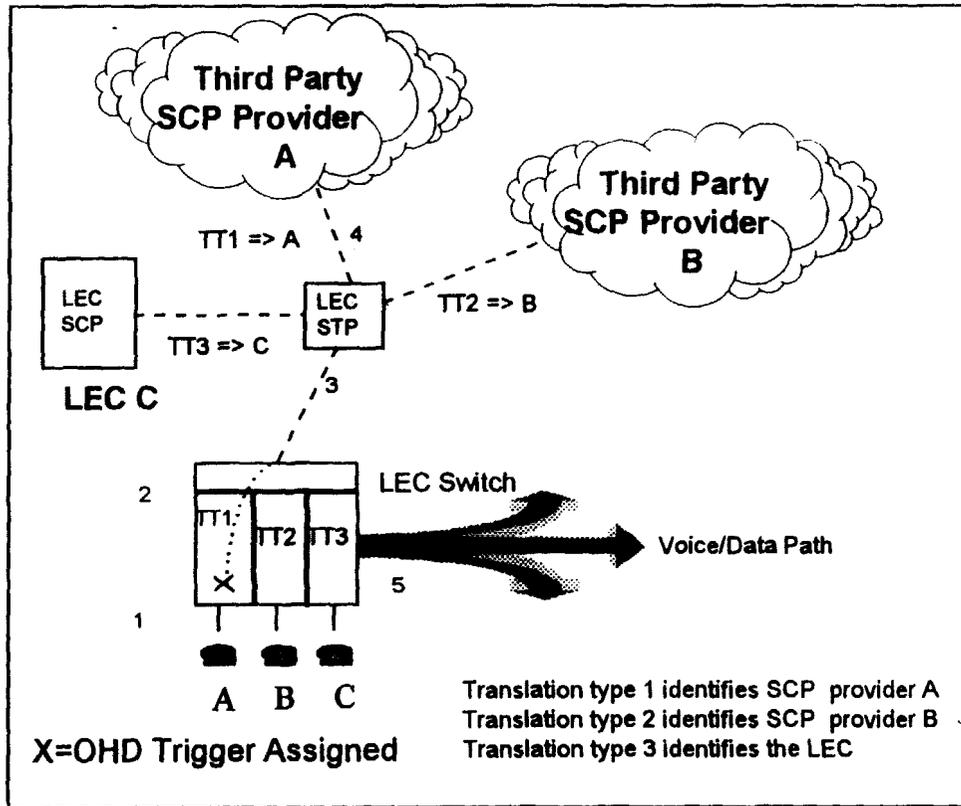
## **References**

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- (2) "CCS Network Interface Specification Supporting SCCP and TCAP," Bellcore, TA-NWT-001432, Issue 1, September 1993.
- (3) "5ESS Switch Advanced Services Platform Release 0.1B," Feature Document, AT&T 235-190-126, Issue 2.0, November 1994.
- (4) "Advance Intelligent Network (IN) 0.1 Switching Systems Generic Requirements," Bellcore TR-NWT-001284, Issue 1.0, August 1992.
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## Acronyms

Acronym	Expanded Term
IN	Advanced Intelligent Network
AMA	Automatic Message Accounting
CCS	Common Channel Signaling
DN	Dialed Number
DPC	Destination Point Code
FCD	Feature Code Dialing
GTA	Global Title Address
IXC	Inter-eXchange Carrier
LEC	Local Exchange Carrier
MTP	Message Transfer Part
OHI	Off-hook Immediate
OHD	Off-hook Delay
OPC	Originating Point Code
PC	Point Code
SCP	Service Control Point
SOC	SCP Overload Control
SOCC	SMS Originated Code Control
SSP	Service Switching Point
STP	Signaling Transfer Point
SPA	Service Package Application
SSN	Sub System Number
SMS	Service Management System
TAT	Terminating Attempt Trigger
TT	Translation Type

## Line Based (Subscribed) Triggers



1. Subscriber A picks up phone and dials number.
2. Call processing is halted at the switch when a trigger is encountered for subscriber A.
3. A Transaction ID is created and placed in the query message. The query is sent to 3rd Party SCP provider A for further instructions. The query contains the calling party and called party digits, where calling party digits identify the subscriber. TT1 identifies 3rd party SCP provider A for that subscriber.
4. Response message for the call is generated and routed back to the switch. Calling party digits are returned to switch with the address of SCP A.
5. Information returned by SCP A is used by the switch to complete call processing of that subscriber's call.

Note: The response message applies only to subscriber A. A new destination number, carrier code, etc cannot affect any other subscriber's call in transit though a switch. Transaction IDs precisely correlate queries and responses with a particular call/line.