COMMITTEE T1 – TELECOMMUNICATIONS
T1 Advisory Group **T1AG/2000-025**
Reno, Nevada; June 21, 2000

EXTERNAL LIAISON REPORT

TITLE: **Report of the CALEA Packet Surveillance JEM; May 3-5, 2000**

SOURCE*: **Vice Chair**

PROJECT: **None (External Liaison)**

ABSTRACT

A Liaison Report of the CALEA Packet Surveillance JEM held May 3-5, 2000.

1. INTRODUCTION

The CALEA Packet Surveillance Joint Experts Meeting (JEM) was held May 3-5, 2000 in Las Vegas, Nevada. under the auspices of the Telecommunications Industry Association (TIA). The meeting was chaired by Peter Musgrove, AT&T Wireless Systems.

The Federal Communications Commission (FCC) invited TIA to report to it by September 30, 2000 regarding certain technical and privacy concerns in packet-mode communications associated with lawfully authorized electronic surveillance under the Communications Assistance for Law Enforcement Act (CALEA). The JEM was organized to assist TIA in this effort. Specifically, the JEM was organized to serve as a technical fact-finding body across the spectrum of packet-mode communication technologies to determine the feasibility of delivering less than the full content of a packet (*i.e.*, addressing information) to law enforcement in response to a pen register order. Invitations were formally offered to more than 40 SDOs and industry organizations, including Committee T1. The meeting was to be run as a standards meeting, under the rules of TIA, addressing all contributions equally and seeking consensus decisions. The goal of the JEM was to document a list of technical alternatives to assist TIA in developing their report to the FCC. In addition, issues associated with each alternative will be identified.

The meeting opened with background presentations on CALEA, J-STD-025, and recent FCC rulings and extensions regarding implementation of CALEA surveillance requirements.

2. PARTICIPANTS

Approximately 70 participants of various SDOs, organizations, and companies – including Committee T1 (Wayne Zeuch, Jay Hilton, Ron Ryan), 3Com, Alcatel, AT&T Labs, Bell Atlantic, BellSouth Cellular, CALEA, Cisco Systems, CTIA, Deutsche Telekom, Ericsson, FBI, FCC, G-Savvy.com, GTE, Intel, Lucent Technologies, MCI WorldCom, Motorola, Nokia, Nortel Networks, Qualcomm, Rogers Wireless, SBC, Siemens AG, Siemens ICN, Steptoe & Johnson,

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Tachion Networks, Telcordia Technologies, TIA, US West, USPhoenix/CDT, USTA, and Verizon Wireless. A complete list of attendees is included as Attachment 1 to this report.

3. CONTRIBUTIONS

Contributions were received from SDOs (Committee T1, TIA TR-45, TIA TR-45.2, TIA TR45.6, ETSI/3GPP JWG) and individual companies (Cisco Systems, Compaq Computers). Contributions to the CALEA JEM and other references from invited organizations can be found on the CALEA JEM Website (http://www.tiaonline.org/standards/CALEA_JEM). A list of all contributions can be found in Attachment 2.

All contributions were introduced and discussed in detail with the exception of the COMPAQ contribution. No representative was present from COMPAQ, so the contribution was briefly introduced to the JEM. Specific recommendations from each contribution were discussed within the context of the intended context of the report to the FCC on packet data surveillance.

The T1 contribution was introduced by Wayne Zeuch and presented in detail by Ron Ryan. It summarized the T1P1 investigations of PCS1900, GPRS, and next generation UMTS to identify capabilities that can be used to report call identifying information for packet mode communication separately and distinctly from call or communication content. Specific proposals were included for the reporting of Access Control Information, Packet Data Communication Addresses, and Call Associated Information. In addition to highlighting the variety of packet mode technologies addressed within Committee T1, the contribution also requested future opportunities to share T1's work on packet mode surveillance and to review the proposed submission to the FCC. The T1 proposals were accepted in principle, as examples of information that could be provided to LEAs to accommodate the privacy concerns of the FCC. Two sections of the contribution were inserted as draft material for the appendix on GPRS technology-specific reporting.

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4. MEETING RESULTS

The discussion led to some high level observations regarding the reporting of call identifying information. The JEM noted CALEA requirements apply to telecommunication services and not information services, but did not have sufficient information to clearly distinguish the two. The JEM concluded that it is not technically feasible to determine, on a packet by packet basis or by observation of a stream of packets, the application or communication service being provided. The possibility of encapsulation or encryption of packets outside of the network makes identifying the application or service even more unlikely. There was consensus that a service provider's ability to provide call identifying information was significantly different based on whether the provider participated in call management or whether the provider was a transport provider. The JEM proposals for the FCC report were structured accordingly, with descriptions of the type of information available to be reported and the technical impacts for reporting that information.

It was clearly difficult to generalize some of the packet-specific information from some of the diverse technologies under discussion. Based on the contributions, however, there was considerable technology-specific information available for discussion (primarily in the areas of IP and wireless). In an attempt to capture call identifying information available from the various packet mode technologies, appendices were created for a number of technologies. A set of appendices was created as placeholders for technology-specific reporting information. Contact persons were assigned for each appendix, where possible, to drive further input/contributions on each technology. Appendices identified at the JEM included (with contact): ATM (David Hoffman, US West; Jay Hilton, Telcordia Technologies), Cable (Bill Marshall, AT&T Labs), CDMA2000 (Mark Munson, GTE), CDPD (Dean Anderson, Lucent), Frame Relay (David Hoffman, US West), GPRS (T1), IP (Chip Sharp, Cisco Systems), ISDN (none), X.25 (none), xDSL (none).

The JEM proposals for the report to the FCC on packet mode surveillance, therefore, includes the main text summarizing the high level technical conclusions on reporting along with technology-specific appendices. The draft JEM report can be found in Attachment 3 to this report. It was recognized that this first draft would need further review and that the appendices would require several weeks to be developed.

A draft schedule for review was discussed during the meeting. The JEM steering committee was chartered with developing a final schedule, distributing draft text, compiling comments, and coordinating reviews.

5. FUTURE WORK

May 22 is the deadline for submitting comments on the main body of the JEM report (i.e., everything except the appendices) to the JEM email reflector. Ron Ryan (T1P1 Surveillance AHG Chair) has volunteered to act as the focal point for Committee T1 comments regarding the draft text. On May 23, a drafting group meeting will be held in downtown Washington, DC to revise the main body of the JEM report based on all comments received via the JEM reflector. The result of this session will be presented as the current status of the JEM report to the May 31 TR45 meeting in Chicago.

June 15 is the deadline for submitting contributions on the technology-specific appendices of the JEM report to the JEM email reflector. The people tasked in Las Vegas with the assignments for the respective appendices are expected to ensure appropriate follow-up on this item.

A second CALEA Packet Surveillance JEM is scheduled for June 27-29, 2000 in the Washington, DC area. This meeting will provide an opportunity for comment on the draft report to the FCC. It is expected that, by this time, most comments will have been submitted via email, technology-specific appendices will have been added, and the editor will have prepared a working draft.

The JEM report will then be finalized by the editor and the JEM steering committee for submission to the August 30-31 TR45 meeting in San Francisco. TR45 is expected to approve the report and forward to TIA. TIA will then use the JEM report to create their report due to the FCC on Sept. 30, 2000.

5.1 Action Items for Committee T1

1. Comments are required on the main body of the JEM report. Comments should be coordinated through Ron Ryan (Tel: 972-684-5444; Fax: 972-684-3775; rryan@nortelnetworks.com) before May 22.
2. Committee T1 input is needed for some of the appendices to the JEM report. The T1 TSCs need to review their relevant technologies and provide content, where appropriate. It is expected that information could be provided by T1 on the following appendices: ATM, Frame Relay, GPRS, ISDN, X.25, and xDSL. Submissions will need to be coordinated prior to June 15.
3. Committee T1 needs to attend the second JEM on June 27-29. Appointment of a delegation will be made prior to that meeting.

Attachment 1 — CALEA JEM List of Attendees

May 3-5, 2000
Las Vegas, Nevada

Name	Company	E-Mail
Ed Campbell	3Com Corporation	Ed_campbell@3com.com
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Attachment 2

Contributions to TIA CALEA JEM

Las Vegas, NV
May 3-5, 2000

CJEM503-	Title and Description	Source
100	TIA/EIA/IS-J-STD-025 Lawfully Authorized Electronic Surveillance: This document is available for purchase from the TIA website. A copy of the new revision A was provided for discussion. This document contains the CALEA requirements developed through the joint efforts of TIA and T1.	Joint TIA/T1
101R1	Method for Identifying Telecommunications Services and Information Services for Packet-Mode Communications Subject to Surveillance Under CALEA: This document identified a method for identifying a packet stream as a telecommunications service, in which case call identifying information can be provided to law enforcement on a pen register or trap and trace court order. This document provided the foundation for the discussion of the differences between a Telecommunication Service and an Information Service. This discussion further leads to the agreement to use the CMS and packet transport as the main categories for the study of the JEM.	TIA TR-45
102P1	Liaison statement (from ETSI SMG10 WPD/3GPP SA3 LI WG) to TIA TR-45 on Harmonized Packet Data Intercept Standards: The document provided the stage 2 description of Lawful Interception within a PLMN for circuit switched systems and GPRS. It does not address the interface between the PLMN and the LEA lawful intercepted product and related information collection functions. This is considered outside the scope of the GSM standard. The contribution was used in the preparation of the GPRS text at the JEM.	ETSI/3GPP JWG
102P2	Liaison statement (from ETSI SMG10 WPD/3GPP SA3 LI WG) to TIA TR-45 on Harmonized Packet Data Intercept Standards: The document describes the architecture and functional requirements within a Third Generation Mobile Communication System (3GMS). The specification shows the service requirements from a Law Enforcement point of view only. The aim of this document is to define a 3GMS interception system that supports a number of regional interception regulations, but these regulations are not repeated here as they vary. The proposal is that Regional interception requirements shall be met in using specific (regional) mediation functions allowing only required information to be transported. The contribution was used in the preparation of the GPRS text at the JEM.	ETSI/3GPP JWG
103	Liaison from TR45.2 – Includes two section of J-STD-025: This contribution provided excerpts from the J-STD-025 which addressed the Packet Data IAP (PDIAP) which provides for access of data packets sent or received by the equipment, facilities, or services of an intercept subject when a packet-mode data service is provided.	TIA TR-45.2 Liaison
104	Packet Mode Communication Call Identifying Information Reporting: This contribution contains a report on T1P1's investigation into the packet mode privacy issue as identified in FCC Report and Order 99-230. It identifies capabilities that could be used to report call-identifying information for packet mode communication separately and distinctly from call or communication content. This contribution was used to develop the GPRS text for the JEM.	T1
105	Approach to CALEA Packet: This contribution proposed the use of dedicated surveillance equipment that may allow for a straightforward solution to many of the CALEA packet data issues now and in the future.	Compaq Computers

	This contribution outlines how such equipment could be developed to meet the needs of all parties concerned. There was no representative present from COMPAQ, so this contribution received little discussion.	
106	TR45.6 Report to TIA JEM on Packet Data Surveillance Capabilities: This contribution provided a report from TR45.6 on possible means for surveillance capabilities in the 3G Packet Data Standard for CMDA2000. This contribution provided text for the CDMA-2000 appendix for the JEM.	TR45.6
107	Comments on Technical Aspects of Electronic Surveillance of Packet Mode Communication: This contribution provides a discussion of some technical aspects of Electronic Surveillance of packet-mode communication. It focuses mainly on issues related to effecting pen register and trap-and-trace surveillance for the Internet Protocol. It does not concentrate on Electronic Surveillance of specific applications (e.g., VoIP); however, it touches on some topics related to applications. This contribution provided text for the IP appendix for the JEM.	Cisco Systems
108	Comments on J-STD-025A in regards to packet-mode communication using IP: This contribution provides specific comments on J-STD-025A, particularly focusing on the packet-mode sections of the document. It includes comments submitted on T1 LB-838. This contribution provided text for the IP appendix for the JEM.	Cisco Systems

Attachment 3

Report to TIA on Surveillance of Packet Data

(First Draft – Incomplete)

1 References

1. TIA /ATIS Interim Standard (Trial Use Standard): Lawfully Authorized Electronic Surveillance, J-STD-025, December 1977
2. Federal Communications Commission, Third Report and Order, Docket 97-213, released August 31, 1999
3. Packet Cable Standard

2 Definitions

CMS: Call Management Server
H.323:
SIP:
VoP:

3 Introduction

This report on Packet-Mode Communication surveillance is developed to address the possibility of providing law enforcement only with the information to which it is lawfully entitled, as requested in the FCC Report and Order (R&O) 99-230 released in August of 1999. The substance of the FCC R&O was a ruling that states there should be a method for delivering packet-data call-identifying information to support Pen Register court orders. The FCC has requested "TIA to study CALEA solutions for packet-mode technology and report to the Commission…steps that can be taken… that will better address privacy concerns". [1][2]

J-STD-025[3] identifies packet-mode as "a communication where individual packets or virtual circuits of a communication within a physical circuit are switched or routed by the accessing telecommunication system. Each packet may take a different route through he intervening network(s).

[1] FCC R&O

[2] If a change to the current standard (J-STD-025) were deemed necessary by the Federal Communications Commission at the end of this process, the JEM recommends that the open, joint T1/TIA activity currently underway in 45.2 LAES Ad Hoc be responsible for completing this task. In its simplest form, this change may just be to include an appropriate reference list to other standards. (Agreed to text from JEM).

[3] J-STD_025

The JEM noted CALEA requirements apply to telecommunication services and not information services, but we did not have sufficient information to clearly distinguish the two in this report. The JEM determined it is not technically feasible to determine, on a packet by packet basis, the application or communication service that is being provided. It is also not technically feasible to determine, by observation of a stream of packets; the application or communication services that is being provided.

The possibility of encapsulation or encryption of packets outside of the network makes identifying the application or service even more unlikely. Therefore, the JEM addressed the issues related to packet mode services in two main categories: (1) packet communication sessions established by a Call Management Server (CMS), and (2) transport services, i.e. packet communication sessions established without a CMS. The CMS may, for instance, be an H.323 GateKeeper, or a SIP proxy, or some other conceptually equivalent protocol. Typically an access service provider that offers a CMS also provides transport.

The JEM decided not to define "call identifying information" for packet services, but rather to identify what information may be available about the packet communication. Once identified, the JEM then reports on the technical impact and feasibility of making that information available to a LEA.

4 Packet Communication Sessions established by a Call Management Server

The service provider that provides a call service via a call management server, e.g. a H.323 GateKeeper or a SIP proxy.

4.1 Information that can be reported

Information available is analogous to J-STD-025 call events, but with respect to each technology, enhancements may need to be made to J-STD-025. For example, with respect to Voice-over-Packet services, the JEM notes that additional enhancements are needed to J-STD-025, for example, reporting VoP calls and associated call identifying information, identifying the content stream, and timing requirements. Other standards may be developed for other technologies or network architectures.

There is no need to provide packet header information if call event information is being reported through the CMS.

There is no need to look into packet data stream for additional information.

4.2 Technical Impacts

The type of call content delivered to the LEA may differ from that negotiated with the provider (i.e., the call-identifying packet stream can not guarantee the user is using the packet stream as negotiated).

Interception of packet services also does not guarantee that the packets have been received by the terminating system.

Call information obtained from the CMS includes the information needed to identify the packet stream supporting this call. Therefore, for a pen register order, there is no need to provide information on a packet-by-packet basis. For example, providing routing addresses for each packet of the communication could affect network performance.

Duplication of a packet stream for electronic surveillance (either for Title III or Pen Register) requires significant resources. The subscriber under surveillance may detect the resulting performance degradation resulting from duplication of a packet stream. Others using the service may also detect surveillance in progress by the degradation of performance.

Vendor studies in one technology (PacketCable) determined that packet duplication of over 5% would have such an impact, and that requirements for duplication capacity in excess of 5% would require redesign of the network. (footnote)

Timing requirements need to be reviewed and may need to be specified for each technology.

5 Packet Communication Sessions established without a Call Management Server

The service provider that provides packet mode transport.

5.1 Information that can be reported, subject to technical impact analysis

Establishment of a communication path across an accessing system from the subject’s device to a network (not the endpoint) may be required before communication between the subject and associate can begin. If so, the establishment and release of this path could be reported. The information provided may be technology-dependent.

Reporting of information beyond establishment and release requires access to the individual packets, which may yield further information such as non-encapsulated routing information. Alternatively, the entire packet could be delivered. It must be noted that either may be difficult and not feasible for some existing systems and architectures, as discussed below.

5.2 Technical Impacts

If the service provider is required to deliver the entire packet to provide call-identifying information for a pen-register, the following issues have been identified.

Duplication of a packet stream requires significant resources. This may be technology dependent. These resources compete with the Title III resources. This may affect the service provided to the provider’s customers.

The subscriber under surveillance may detect the resulting performance degradation resulting from duplication of a packet stream. Others using the service may also detect surveillance in progress by the degradation of performance. The JEM notes that a single subscriber to the packet transport service may utilize excessive packet capacity. [4]

Consensus is that examining beyond the outermost routing header of a packet, e.g. IP header, ATM cell header, Frame Relay header, X.25, etc., to identify call-identifying information is not technically advisable (i.e. technical complexity, extreme processor load, encryption, unknown protocols, inability to identify the target).

Consensus is that the information gained from examining the outermost header may not yield useful call-identifying information (e.g. the actual identity of the subject and associate endpoints).

The above considerations are magnified as access speeds increase to gigabit/sec and faster.

Timing requirements may be different

6 Appendices:

Notes: Contact people. Guide to appendices. Bullet list of what protocols will have appendices. Technology specific information.
Expand above information, based on technology.
Most will make reference to the appendix on IP or ATM
Include references to open documents on the technology.
Note that we did not receive contributions for all possible packet technologies.
Not all packet technologies were represented at JEM.

Appendix: CDMA2000

Mark Munson

Appendix: GPRS

T1.

Appendix: ATM

David Hoffman dwhoffm@uswest.com
Jay Hilton (T1S1)

Appendix: IP

Chip Sharp

[4] Vendor studies in one technology (PacketCable) determined that packet duplication of over 5% would have such an impact, and that requirements for duplication capacity in excess of 5% would require redesign of the network.

Appendix: Frame Relay

Dave Hoffman

Appendix: CDPD

Dean Anderson, Lucent

Appendix: X.25

none

Appendix: Cable

Bill Marshall

Appendix: xDSL

None

Appendix: ISDN

none

Appendix: TDMA

Covered by GPRS