出席太平洋電信協會(PTC)第二十六屆年會

報告書

服務機關： 交通部電信總局
出 國 人 職　稱： 科　長
姓　　名： 徐國根
出國地區：美國夏威夷
出國期間：九十三年一月十日至一月十六日
報告日期：九十三年四月十六日

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　　　出席太平洋電信協會(PTC)第二十六屆年會
主辦機關:
　　　交通部電信總局
聯絡人／電話:
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　　　徐國根　交通部電信總局　綜合規劃處　科長
出國類別: 考察
出國地區: 美國
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內容摘要: 太平洋電信協會（PTC）第二十六屆年會援例於夏威夷檀香山舉行，今年
　　　的主題是 "新時代/新策略－資訊通信科技再度復甦　（New Times－New
　　　Strategies：ICT Rising from the Ashes），計有來自五十多個國家地區的八百
　　　餘人與會，同時舉辦電信設備展覽，參展廠商達四十餘家，其中各項會議
　　　之主席及演講者人數即達二百餘人。年會活動包含會員大會、各常設委員
　　　會會議及各種研討會等，研討會包括八場大會/超級論壇（Plenary/ Super
　　　Session）、二十九個並行論壇（Concurrent Session）、六個場次的講習會
　　　（Workshop）及三個場次的圓桌/小型討論會（Round Table /Panel），探討
　　　商業與財務、新興起的技術、轉變的應用/遠距學習、發展、政策/監理等
　　　重要議題，規模盛大。

本文電子檔已上傳至出國報告資訊網

摘要

太平洋電信協會（PTC）第二十六屆年會援例於夏威夷檀香山舉行，今年的主題是"新時代/新策略－資訊通信科技再度復甦"（New Times－New Strategies：ICT Rising from the Ashes），計有來自五十多個國家地區的八百餘人與會，同時舉辦電信設備展覽，參展廠商達四十餘家，其中各項會議之主席及演講者人數即達二百餘人。年會活動包含會員大會、各常設委員會會議及各種研討會等，研討會包括八場大會/超級論壇（Plenary/ Super Session）、二十九個並行論壇（Concurrent Session）、六個場次的講習會（Workshop）及三個場次的圓桌/小型討論會（Round Table /Panel），探討商業與財務、新興起的技術、轉變的應用/遠距學習、發展、政策/監理等重要議題，規模盛大。

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出席太平洋電信協會(PTC)第二十六屆年會

報告書

壹、前言

太平洋電信協會(Pacific Telecommunications Council, PTC)為一國際非官方組織之非營利性會員制機構，1980 年於夏威夷創立。原參加成員多為太平洋地區之主要電話公司，後經逐年擴大成員範圍至電信設備製造商、電信顧問公司等電信相關廠商及個人，共分營利團體會員、非營利團體會員、個人會員、學生及附屬會員等五大類。截至今年一月共有會員四百三十七名。電信總局於 1983 年起加入為營利團體會員，直至 1996 年改制變更會員屬性為非營利團體會員，同年中華電信公司則以營利團體身份加入。

PTC 在亞太地區通信及其相關科技產業發展中扮演重要的角色，包括電信服務業者、消費者、決策者、技術人員、律師、科學家、及學者共同參與會中討論。本局去年因大會邀大陸入會而未派員參加，本年恢復出席；國內電信業者包括中華電信公司與其他三家固網業者、大哥大業者、ISR、IDC、民營海纜業者及廠商均派有代表參與。

近年來電信服務業者及通訊廠商更利用此盛會進行雙邊會議，已形成大會年會之外，會員間另一項重要的活動。中華電信公司與國內民營固網業者皆利用此機會與國外電信公司舉行多場之雙邊會議，對於我國電信服務之推動將有實

質之助益。

　　太平洋電信協會第二十六屆年會（PTC '04）援例於夏威夷檀香山舉行，會議地點在 Hilton Hawaiian Village，今年的主題是 "新時代/新策略 — 資訊通信科技再度復甦"（New Times - New Strategies：ICT Rising from the Ashes），計有來自五十多個國家地區的八百餘人與會，同時舉辦電信設備展覽，參展廠商達四十餘家，其中各項會議之主席及演講者人數即達二百餘人。年會活動包含會員大會、各常設委員會會議及各種研討會等，研討會包括八場大會/超級論壇（Plenary/Super Session）、二十九個並行論壇（Concurrent Session）、六個場次的講習會（Workshop）及三個場次的圓桌/小型討論會（Round Table /Panel），探討商業與財務、新興起的技術、轉變的應用/遠距學習、發展、政策/監理等重要議題，規模盛大。

貳、行程安排

　　　　一月十日　　　　　　自台北中正機場啟程

　　　　一月十一日　　　　　參加會員大會及開幕

　　　　一月十二至十四日　　參加研討會

　　　　一月十五日　　　　　啟程返國

　　　　一月十六日　　　　　返抵國門

參、會員大會紀要

　　本屆會員大會於一月十一日上午十一點召開，由加拿大籍 Mr. Bruce Drake 主持，首先通過草擬的議程並依照議程逐項進行。在主席致歡迎詞後，會議首先由韓國籍現任PTC會長/管委會主席的 Mr. Hansunk Kim 在會中作綜合報告簡述 PTC 規模現況及未來工作重點(詳見附件一)；隨後並討論年度計畫、收支及預算報告。

　　Mr. Hansunk Kim 首先介紹本次會議主題的緣由，係因過去一年被認為是 ICT 產業所面臨最為艱困的一年，然而從會員及各種跡象的反應顯示，今年ICT產業將會從經歷最近 3 年的困境中復甦。而在去（2003）年PTC 的組織與運作架構亦作了重大的變革。依據 2002 年 1 月理事會（Board of Trustees）決議，PTC 的管理架構由原來的理事會與執委會(Executive Board)改由管委會（Board of Governors）與諮委會（Advisory Council）替代，並自 2003 年 1 月所召開之 2003 年 PTC 年會開始運作。面對 ICT 產業近年來所面對之困難，管委會在 2003 年所召開之第一次會議時就面臨會員與年會出席會議人數及展覽廠商數目嚴重衰退的問題，為了維持 PTC 財務的持續穩定，管委會不得已決定不再續聘執行長並且刪減秘書處之規模、減少出版品之支出、縮小辦公場所空間等各種措施以節省財務之支出。

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目前管委會之主要成員在沒有執行長的架構下已直接參與會務的運作。管委會委員由繼任規劃委員會（Succession Planning Committee）負責推薦選出，每年將更換一半的委員數目，以順利管理階層的交接與運作。

大會並通過了新選任管委會人員名單(名單詳見附件一之 Annex)，任期為一年（2004 年 1 月至 2005 年 1 月），Mr. Hansunk Kim 卸任會長與管委會主席職務並擔任管委會委員，由現任 PTC 副會長/管委會副主席 Mr. Bruce Drake 接任 PTC 會長/管委會主席職務，會議中 Mr. Bruce Drake 及與會會員對於 Mr. Hansunk Kim 過去的努力均表示非常的感謝。

會中也公佈了本年中（2004 年 9 月 14 日至 15 日）將在中國大陸天津舉辦研討會，主題為「中國－世界 IT 及 ICT 產業的機會與挑戰」，該項研討會將探討 ICT 產業之最新發展與預測未來的方向，研討會期間亦會舉辦電信展，相關資訊可從網址：www.my2004.org 查詢。

肆、研討會紀要

一、研討會共有多種型態，包括會前的一些圓桌會議(Round

Table)、小組討論會(Panel)和講習會（Workshop）等偏重於互動且較隨和式的討論議題，集中在一月十一日等同是會前的暖身；邀請電信界知名人士發表廣泛式演說之大會（Plenary）；超級論壇(Super Session)則由高層主管及專家們就政策、工業界和科技面進行深層的探討；併行論壇(Concurrent Session)涵蓋範圍更是廣闊，同時在不同的會議廳進行。本次年會之研討會議程如附件二。研討會的會議資料可上網擷取，可連上本次會議專門網站（www.ptc2004.org）再點選 Program 後選擇所要查詢的會議項目，輸入用戶名稱 ptc04papers 以及密碼 phoenix，即可下載資料。

二、由於 2001 年美國受到九一一恐怖攻擊後，戰火綿延至伊拉克，而阿富汗受到戰火蹂躪已超過二十年，因此有一場圓桌會議即針對如何協助這兩個國家的電信網路重建，讓其可回歸平和與建設性的國際社會，參與討論的主要成員之一為自 2002 年即擔任阿富汗政府的主要美國電信顧問的現任 PTC 諮委會委員 Mr. Ken Zita。另外有一場邀請電信專家舉行的小型討論會，討論如何透過合作以減少數位落差。講習會中有關 VoIP 與 Spam 兩項議題已是電信界關注的討論話題，VoIP 這項議題目前許多國家的電信監管單位將針對該項技術因為技術之匯流所衍伸出新的服務型態以及對於現有電信環境與

監管之衝擊加以研究討論，由於監管機關（例如 FCC 及歐盟）對於監理機制之檢討仍處於進行階段，因此此次研討會主要仍著重於技術的實務介紹，法規與監管機制方面恐怕要等下次年會才會有所介紹。Spam 議題則由美國一家反 Spam 的軟體公司總裁 Peter Kay 提出「解決垃圾電子郵件問題」報告，簡報內容見附件三。該報告指出垃圾電子郵件是目前網際網路之首要問題。而近期 Forbes 雜誌報導令人震驚的數字：4.9 百萬兆垃圾電子郵件訊息將被傳送及垃圾電子郵件佔所有電子郵件之 45%。在有關何謂垃圾電子郵件之任何公開討論中，沒有人能明確指出垃圾電子郵件之範圍。然而，人們通常同意垃圾電子郵件是寄給某人其不需要之電子郵件。網際網路標準團體（包括反垃圾電子郵件研究團體(ASRG)、網際網路研究工作小組(IRTF)、網際網路工程工作小組(IETF)及網際網路社會(ISOC)）已將該問題歸為「以同意為基礎之通信」。以同意為基礎之通信係意指使用者能設定方針，該方針係描述有關以什麼方式、什麼時間及什麼人能寄給他們電子郵件之條件。將來使用者不必像以前大多數之情況下，無條件接受所有適當位址之電子郵件。在演講者所建立之網站（網址：www.titankey.com/ptc/）有整理許多有關 Spam 的資訊，可作為將來研究的參考。

三、此次年會的大會（Plenary）循例邀請電信界知名人士發表廣泛式演說，今年連續三天每天都有一至二場的大會演說，如首日主題便是「未來展望」，其他主題包括「（資訊網路）安全」、「受監管之市場」、「達到更多人/無所不在的社會」、「作更多的無線設備」及「建立實行的夥伴關係」。今年舉辦了兩場超級論壇(Super Session)，由高層主管及專家們就政策、工業界和科技面就衛星與海底通信產業進行深層的探討。

四、併行論壇(Concurrent Session)主要由三天二十九個併行會議論壇所組成，為研討會的重點，就應用領域之不同，分別依商業與財務(Business and Finance)、興起的技術 (Emerging Technologies)、轉變的應用/遠距學習(Transformational Applications / Distance Learning)、發展(Development)、主題會議(Featured Sessions)及政策/監理(Policy/Regulatory)等六大範疇進行演講。不同的議題在不同的會議室同時進行討論，會議資料可依前述方式上網擷取。

五、在政策監理方面，今年皆由研究單位提出專題報告，如我國世新大學法研所提出的數位電視必需承載規則（Digital Must-Carry Rules）之法規分析，日本提出如何在資訊系統上建構其所建議之架構以獲取線上使用者之信任，香港則對於部分國家所採用之法規提出研究報

告。

六、自 Vonage 公司推出網路電話服務以及 FCC 進行 VoIP 監管機制的探討後，VoIP 已變成電信界關注的議題。Vocal 的兩位代表提出了一邊論文，就既有業者因應 VoIP 的需求提出探討（附件四）。該報告指出電信產業目前正處於進入封包通訊"第三波"革命的關鍵時刻。近年來，由於 VoIP 技術的發展，以及新商業模式的激勵，VoIP 漸漸被推向主流市場。VoIP 具有先進的連網方式、交換成本大幅降低、智慧型網路與創新服務等優勢。國際上愈來愈多封包語音的解決方案證明電信業者將 VoIP 技術視為在競爭激烈的市場中達成其營運目標的最佳手段。在可預見的未來，由於語音服務仍將持續是電信業者營收的主要來源，電信業者勢必要在其中尋找維持其獲利率的新方法。因此，這個挑戰就提供了一個舞台給 VoIP。

該報告將 VoIP 依其演進的浪潮區分為三個波段，第一波為電腦對電腦在網際網路上免費的語音通信，第二波為使用 VoIP 技術提供國際長途服務，估計 VoIP 的通信量在 2005 年前將佔有 35% 的國際長途市場。競爭業者將採用 VoIP 技術於其核心網務架構並大部分用於提供國際長途服務，有些國際長途服務之既有業者例如德國電信、中國電信新加坡電信及 AT&T 則在其傳統 TDM 網

路外另外同時建設 VoIP 網路。VoIP 網路的發展在剛進行解除管制的經濟發展中國家如印度、中國進行的非常成功。在印度,採用 VoIP 骨幹架構的數據接取在推出服務六個月時即已佔有約 30% 的國際長途市場。相較於第二波 VoIP 主要由既有業者以外的競爭業者針對國際長途市場所建置,第三波時既有業者已逐漸接受封包化電話技術以因應日漸茁壯的國內長途市場。據估計,國內長途市場的通信量分鐘數約為國際長途市場的十五倍,2002 年全世界國內長途市場有 720 億分鐘係透過 VoIP 網路傳送,預估到 2007 年國內長途的訊務量將達到 9250 億分鐘。電信業者為因應競爭應該提供更多樣化與更具吸引力之服務,採用新的技術並擴大市場。

現今封包語音技術標準包括兩種—H.323 及 SIP,先前採用 H.323 的 VoIP 國際長途電路高達 90%,但隨著解除管制、國際化及新興電信市場的出現,H.323 漸漸無法滿足電信業者互連互通上的需求,SIP 則剛好有提供 VoIP 語音應用的成熟度。SIP 因此快速被運用於下一代網路(NGN),其在與其他網路的互連互通上及新整合性服務的提供上表現相當良好,而成為電信產業邁入第三波的主要因素。

在此「全 IP 化」的新世界中,既有業者將面臨更大的挑戰,為增加新客源,提升通信量及營收,電信業者設

法提供先進的服務，尤其是針對快速成長的企業用戶提供 VoIP 服務（Hosted VoIP services），例如：IP-PBX、call centers、conferenceing、VoIP VPN 等。而既有業者亦將建置大量的軟交換機（softswitch）式網路以因應非常龐大的國內長途市場。這篇報告的內容可作為國內業者經營發展的參考。

伍、感想與建議

一、本屆會議的主題是"新時代/新策略－資訊通信科技再度復甦"（New Times - New Strategies：ICT Rising from the Ashes），當北美與歐洲仍掙扎於期待經濟的復甦時，一些亞洲國家如韓國、日本及大陸正加速吸取資訊新科技（Information and Communication Technologies-ICT）在寬頻網路與應用服務方面呈現蓬勃之發展，而居世界領先地位。PTC 除了結合美國、加拿大等先進國家的專家、官員，更重要的是了解亞洲國家在 ICT 領域的實力，將這些國家聚集一起並與國際組織連結，而每年的 PTC 會議，提供先進的經驗與對未來趨向之論壇，對於 ICT 產業而言是一個非常值得參與前往取經的機會。

二、整體而言，今年的研討會較往年更具規模，惟鑒於美國以前受到九一一的恐怖攻擊造成嚴重損傷，而會前又有美國將再次受到恐怖份子攻擊之傳聞不斷，為防止恐怖

攻擊的再次發生，因此美國簽證政策要求對於出入境更加嚴格控管，間接造成參加此次年會人數與參展廠商持續減少，而以往邀請參加會議之政府單位官員或國際組織代表亦較往年減少或者降低出席代表之層級。恐怖攻擊對於美國經濟造成的不良影響恐非短期可以消失。

三、本屆大會第一天發生一件大新聞：來自菲律賓的三十位各電信公司出席主管，因美國政府認為彼等在處理提高國際電話至菲律賓之落地費時對 AT&T、MCI 等美國公司不公平，而收到美國司法院之傳票候傳，以致我國之電信公司與菲律賓 PLDT、Global Telecom、SMART etc. 之雙邊會議均取消。美國司法部 Antitrust 部門在 PTC 會議期間，傳訊有關 2003 年 2 月菲國電信業者聯合調漲落地費事宜，各國代表均感震驚。由此可看出攤分費率除了是電信業者間的商業談判外，對各國的經濟與外匯有極大的影響，菲、美國政府才會介入，如何在保障國家利益的前提下，兼顧市場競爭機制，將是各國電信監管機構監管的方向。

四、透過 PTC 的活動，尤其是年會的參與，可獲得各種互動的機會，對促進商機具有極大之助益，故宜鼓勵國內業者踴躍參加；而值此電信產業蓬勃發展之際，我國會員亦應順此趨勢，積極參與以廣結人脈拓展商機。此次中華電信公司與國內民營固網業者皆利用此機會在大會年

會之外與國外電信公司舉行多場之雙邊會議，善於利用會議的效能，對於我國電信服務之推動將有非常大之助益。此次年會有許多國外業者贊助大會的宴飲等活動，包括 Alcatel、Qwest、SK Telecom、Verizon 等公司，這一切努力都在提升知名度，拓展業務關係，其強烈的企圖心與做法，值得國內電信業者參考。

附件一：會長報告

Pacific Telecommunications Council

President's
Report
2002/2003

American Samoa
Argentina
Australia
Bangladesh
Bermuda
Brunei Darussalam
Canada
Chile
Chinese Taipei
Colombia
Cook Islands
Fed. States of
Micronesia
Fiji
France
French Polynesia
Germany
Guam
Hong Kong SAR,
China
India
Indonesia
Japan
Macau
Marshall Islands
Mexico
Mongolia
Netherlands
New Zealand
Niue
Papua New Guinea
People's Rep. of China
Peru
Philippines
Republic of Kiribati
Republic of Korea
Republic of Palau
Russia
Samoa
Singapore
Solomon Islands
Sweden
Switzerland
Thailand
United Kingdom
USA
Vanuatu

Letter to PTC Members from PTC's President

Aloha PTC Members:

The year 2003 has arguably been the most difficult that the Information and Communication Technology (ICT) industries have ever faced. As a major international organization that specializes in ICTs, PTC has not escaped. Nevertheless, there are many indications that the worst is now behind us. The theme of PTC'04, *New Times, New Strategies – ICT Rising From the Ashes*, is therefore an appropriate indicator of the increasing optimism that focuses much more on future opportunities than past challenges.

PTC faced formidable fiscal, operational, and organizational challenges in January 2003 at the Members' Meeting just prior to the first meeting of the Board of Governors in the new management structure of PTC. The results of the measures taken by the new Board of Governors at that time to assure PTC's financial viability are now available for all of us to see. While the challenges have not yet disappeared, the encouraging surge in last-minute registrations for PTC'04 leads us to believe that there is indeed light at the end of the tunnel. We have traversed the year 2003 with considerable help from the Secretariat and the Advisory Council. Key members of the Board of Governors have been directly involved in the operation of PTC, in the absence of an Executive Director. I wish to give my thanks to the many who have contributed to this effort.

PTC's strength has always been in its members. It is a member-driven and supported organization. One of the most encouraging signs for the future is that many new members are ICT leaders in every sense of the word and are replacing old-technology members and other members that did not have adequate financial or intellectual resources. Many of these new members do not yet have the financial resources that characterized major PTC members in the past, but they are growing and more are being added to the membership rolls every week. In that sense, PTC's future as a forward-looking, growing organization is assured.

We must continue to focus on improving our excellent annual conferences and making PTC more relevant, responsive, and beneficial to our members. We have to face the challenge of delivering more benefits to our members who expect much more than reduced conference registration fees and twice-a-year networking opportunities. PTC has to be useful and visible to all of our members every single day of the year. Membership dues were approaching 50% of PTC's annual revenues at the peak of the ICT industry. We have to deliver better and more relevant benefits if we are to again achieve adequate support from dues, which translates into better services for members.

More than ever, the annual conference has become the keystone of PTC. For PTC'04 we have devoted significant time to finding speakers who would elevate the prestige and level of discussion. The event itself has attracted many key industry people. As we move ahead, we need to determine where the most interest lies. For many years, engineers, scientists and academics constituted a significant percentage of our annual conference attendees. These attendees have considerably declined in number and proportion since the new Millennium began. Yet, we know that these are precisely the types of people that ICT industries need to move ahead. Conferences that attract them are showing increasing attendance. Security is another area that is attracting huge funding, especially from governments. We need to tap those resources effectively.

Finally, we must never forget that one of the founding goals of PTC was to assist in the beneficial development of telecommunications (now ICTs) in the Pacific Hemisphere. We must again find resources to expand our outreach to the developing countries of the region, especially in cooperation with the ITU and other United Nations specialized agencies, the Asia-Pacific Telecommunity (APT), the Asia-Pacific Broadcasting Union (ABU), the Pacific Islands Telecommunication Association (PITA) and other regional organizations.

Of course, much work remains to be done in 2004, and the continuing efforts will be infused with new energy as we move ahead, thanks to our new members and the devoted efforts of many of our long-time members who have made PTC what it is today.

Sincerely,
Hansuk Kim
President
Pacific Telecommunications Council

PACIFIC TELECOMMUNICATIONS COUNCIL
PRESIDENT'S REPORT for 2003

A. Policy Matters

1. In accordance with the decisions made by the PTC Board of Trustees at its January 2002 meeting, and subsequently approved by an 87% majority of voting PTC members, a new governance structure for PTC replaced the former Board of Trustees and Executive Board with a Board of Governors and an Advisory Council, effective at the meetings of the respective governing bodies during PTC2003 in January 2003. At the same time, the existing Articles of Incorporation and Bylaws were appropriately revised and amended.
2. At its first meetings in January 2003 the Board of Governors was faced with an unprecedented situation brought about by a sharp decrease in attendance and exhibitors at the annual conference and a precipitous decline in membership.
3. As a consequence, difficult decisions were made by the Board to help assure the continued financial viability of the Council. These included a decision to not renew the contract of the Executive Director, which was due to end in June 2003, and to drastically reduce the size of the Secretariat to maintain the core mission of the Council to organize and present the annual conference and mid-year seminar and meetings.
4. With the continuing in-place assistance of Board member Dr. Mark Hukill in Hawaii, the Board of Governors maintained a close watch on the progress of PTC's financial health throughout 2003. Further adjustments, described later in this report, were made as time progressed. These included a sharp reduction or discontinuance of publications, reduction by more than 40% of the PTC office space and re-negotiation of the associated facilities contract and termination of the staff pension plan.
5. As a result, PTC is currently financially viable and is now preparing to resume growth along with the rest of the global information and communication technology (ICT) industry.

B. Governance Transition

Following the successful transition from the previous governing structure in 2003, PTC established a Succession Planning Committee (SPC) under the leadership of Dr. Katsuhiro Onoda. The principal task of this important committee in 2003 was to conduct an election to fill the seats of Board members whose terms expire in January 2004. (Election to the first Board of Governors included seats with a one-year term instead of the usual two years, so that future annual elections will replace about half of the members.) PTC members voted on the candidates whose nominations were approved by the SPC in September 2003 and the results were announced near the end of November. Six newly-elected Governors will fill the seats vacated by the six Governors who completed their one-year term. One of these ran for a full term and was re-elected. (See Annex for the names of Governors in 2003-2004 and 2004-2005.)

C. Conference and Seminars

1. The PTC2003 Annual Conference

There was a total of 1164 registered delegates and 56 exhibitors in 68 booths at PTC2003. Contributions from PTC members and others totaled approximately US$343,486. In comparison, at PTC2002 there was a total of 1,460 registered delegates and 69 exhibitors in 84 booths and contributions from PTC members and others totaled approximately
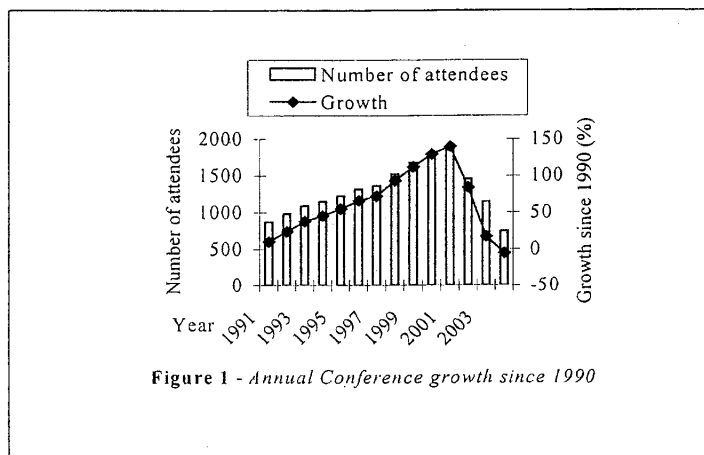

Figure 1 - *Annual Conference growth since 1990*

US$431,000. The historical attendance figures and rate of growth are illustrated in Figure 1.

The delegates came from 52 countries and included, among others, high-level government officials, senior executives, policy makers, lawyers, consultants, managing editors, publishers, policy analysts, academics and engineers.

In spite of the greatly diminished number of participants, there was general agreement that the plenary and concurrent sessions at PTC2003 were among the best that PTC has ever organized. Perhaps because most attendees were tightly focused on future activities and results, there was exceptionally good attendance at and participation in the key sessions.

The small but well-presented exhibits provided a useful opportunity for exhibitors and participants alike to get up-to-date on the latest technology and operational activities in global information and communication technology (ICT) industries.

2. **Mid-Year Meetings and Seminar**

   a. The 2003 mid-year meetings of the Board of Governors, Advisory Council and Conference Committee took place 26 May 2003 just before the PTC Mid-Year Seminar at the Tokyo Bay Hilton (27 and 28 May 2003). This year's mid-year meeting and seminar featured top-notch senior level speakers and strong support from leading telecommunication companies, including NTT Communications, KDDI Corporation, Chunghwa Telecom, Reach, Fujitsu, Hitachi, IBM Japan, Ltd., Japan Telecom, Mitsubishi Electric Corporation, NEC, NTT DoCoMo, OKI, Panasonic/Matsushita and others. The seminar provided Asian perspectives on the development and future prospects of the ICT industry and included a special Development Workshop organized by the PTC Special Interest Group on Developing Nations.

   b. The successful seminar had an attendance of some 200, including 18 overseas participants from Australia, Canada, Hong Kong (China), New Zealand, South Korea, Singapore, Thailand and the United States. PTC and the PTC Japan Committee were the joint organizers of the event.

   c. Keynote addresses were given by NORIFUMI KATO, Senior Vice Minister of the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) and Member of the Councilors, Japan and TADAO SAITO, Professor at the Chuo University and Honorary Professor of the Tokyo University. The program included an impressive list of additional speakers, including some of the *"who's who"* of the ICT industries in Japan: MASANOBU SUZUKI, President, NTT Communications Corporation; TADASHI ONODERA, President, KDDI Corporation; TATSUZUMI FURUKAWA, President, NIFTY Corporation; KATSUNORI UEDA, President, Nihon Enterprise Co., Ltd.; NAOHIRO YOSHIKAWA, Group Manager and Senior Consultant, Nomura Research Institute; YOSHIAKI KUSHIKI, Managing Director, Matsushita and KEIJI TACHIKAWA, President, NTT DoCoMo. The speakers covered a variety of topics, including *The Future of Info-Communications in Asia-Pacific, New Platform Business, Creation of New Lifestyles* and *Entertainment Revolution.*

   d. The PTC Japan Committee contributed greatly to the success of the mid-year event in 2003, with gracious hospitality and expert planning and execution. This was PTC's fourth successful seminar held in Japan, following earlier seminars in Gifu, Sendai and Yokohama.

D. Membership

During the past ten months from 1 February 2003 (official start of membership year), through 15 December 2003, a total number of [..] new members have joined PTC as compared to 76 new members during the same period last year. Membership activity continues to be a major concern because the rate of resignations and terminations has not diminished and resignations are not being offset by new member growth: A total of [...] resignations or terminations was recorded from 1 February through 31 December 2003. During the same period a year ago, there were 130 terminations. Economic factors continue to play a role in resignations. A number of the "resigned" members are among organizations that no longer exist.

Before 2003, recruitment and retention of members was primarily the responsibility of the Executive Director and the External Affairs or Membership and Marketing Manager. As part of the measures taken to sharply reduce expenses and cash flow in 2003, those posts were vacant throughout the year. The consequent lack of full-time membership activities undoubtedly also contributed to the continuing decline in membership.

E. Outreach

1. Outreach is a primary function of the Executive Director. Since that post was not occupied during the 2003-2004 year (1 February 2003 – 31 January 2004), PTC was not represented at many international conferences and events that usually had PTC representation by the Executive Director or External Affairs Manager.
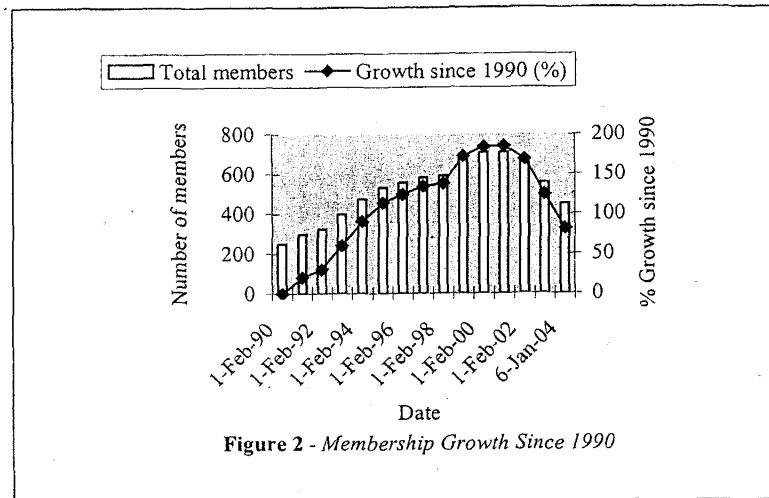

Figure 2 - *Membership Growth Since 1990*

2. The PTC President represented PTC at the Third PECC International Trade & Investment Fair, October 2003, (Tianjin) China Exhibition on Computers, Software, Networks & Communications and a forum on Informatization & New Approach to Industrialization in Tianjin, China.

3. The Board of Governors authorized the establishment of an affiliated chapter of PTC in Hawaii in 2003. The PTC Hawaii chapter held an inauguration meeting and seminar on 11 December that was attended by nearly 50 people who are active in ICTs in Hawaii. PTC'04 information and exhibit brochures were also distributed at the meeting. A primary objective of the Hawaii chapter is to increase awareness of PTC and encourage membership and participation in PTC activities.

4. Existing affiliated chapters in Japan, Korea and India continued to function in 2003 and contributed to maintaining membership in PTC and participation in its activities.

F. Publications and Communications

As part of the severe economy measures taken in 2003, all PTC publications were discontinued or greatly reduced until improvement in the economic situation warrants renewed or increased publication schedules.

Conference *Proceedings* will be available to attendees as a PTC Web publication, during and after PTC'04. A CD-ROM will also be made available to PTC'04 attendees upon request, at some time after the conference.

The *Members' Bulletin*, which was being distributed via e-mail and posted on PTC Web twice a month in 2001 and 2002, was considerably reduced in scope and was distributed via e-mail three times in 2003.

One issue of the *PTR*, PTC's quarterly magazine, was distributed in 2003. Since it had already been prepared when the embargo on publications was announced, it was posted on PTC Web in June 2003, however no printed copies were distributed.

G. Research and Exchange Programs

1. **Special Interest Group on Research**

Following announcement of budget reductions that eliminated funds for the usual Essay Prize and research grants, the PTC Special Interest Group on Research undertook a campaign to obtain external funding. A member of the committee, Dr. Tom Cooper of Emerson College, was able to obtain a one-time grant of US$2,500, which was sufficient to fund a single Essay Prize in 2003.

The committee evaluated six qualified essays that were submitted and chose a single winner, Ms. Bingchun MENG of Pennsylvania State University, for her essay *Infrastructure, Service and Trust: Assessing the*

Environment of E-commerce in China. She was presented the prize at PTC'04 by the committee chair, Dr. Heather Hudson.

More than 30 researchers attended the Researchers' Luncheon at PTC 2003, including several members of the Board of Governors. Committee members who attended the committee meeting at PTC2003 made helpful suggestions for PTC research activities. Members of the Committee also participated in the PTC mid-year meeting in Tokyo.

The committee remained very active throughout the year and plans to continue the Essay Prize and research grant programs in 2004, provided funds can be found.

2. **Student Internships**
PTC continued its involvement with student programs. For the 12th time in the last 13 years,
PTC accepted an intern from Singapore who contributed to preparation of future conferences and seminars during November and December 2003. A number of volunteers from local universities continued to contribute to the PTC conference activities. PTC remains committed to participation in programs such as this as one of PTC's growth and development programs.

H. Management

1. **Financial Status of PTC**

Following significant cutbacks and restructuring in response to the economic uncertainties of recent years, the Council remains in a tenuous financial position. The external audit that was completed in August 2003 reported a fund balance of US$455,816 as of 30 June 2003, a decrease of US$322,657 from the previous year, primarily due to the shortfall in conference attendance from projections. Combined with the previous net loss of US$254,386 in 2002, PTC has lost a total of US$577,043 in the past two years – approximately 60% of its net worth, from the maximum at the end of June 2001. The financial challenges the first Board of Governors faced are made very clear by these numbers, as is the importance of the current Board's decisions.

If registration for PTC'04 continues at the current rate, we can expect a turnout about 15% less than in 2003, which will further reduce our financial reserves, although at a much slower rate, since our costs have been drastically reduced. If our turnout for PTC'05 returns to the level attained at PTC2003 and other factors remain unchanged PTC should achieve stability – no longer needing to draw down its reserves to fund its ongoing operations.

A number of other variables remain, including:

(a) Memberships have been declining; dues revenues have gone from a high of US$611,300 as of 30 June 2001 to US$430,200 at 30 June 2003. The current year will show additional reductions, possibly down to US$330,000, depending on the amount that ultimately cannot be collected.

(b) Sponsorships – which have the potential to cover many conference related costs and valued aspects of PTC such as assistance awards, conference and seminars, opening and closing ceremonies – have remained relatively stable over the past four years, ranging from US$350,000 to US$480,000.

(c) Secretariat costs - our staff size was reduced from 19 to 10; annual payroll costs have been reduced correspondingly, from a high of US$1,083,600 at 30 June 2002 to a projected US$554,700 at 30 June 2004.

The US$400,000 deposited in the professionally managed Merrill Lynch accounts in September 1998 has grown to US$431,232 as of 30 November 2003. (Note: this balance was reduced by a withdrawal of US$50,000 made in July 2003, to help cover operating expenses.) In June 2003, these funds were reallocated to less risky investments (largely bond funds) at the direction of the Board of Governors, with the advice of the Merrill Lynch consultants, with some investment gains achieved, due in part to a general improvement in stock market conditions.

This strategy seems to have been successful so far: the investment balance at 30 November 2002 was US$444,755; currently (at 30 November 2003), it would have been approximately US$480,000, if not for the US$50,000 withdrawal. In summary, PTC's financial situation has declined for the past three years. The

decline has lessened this year, with significant cuts in expenditures and PTC is positioned to function at a lower annual cost now on an ongoing basis.

2. **PTC Secretariat Administration**

In light of severe budgetary concerns caused by the shortfall in attendance at PTC2002 and PTC2003, a reduction in force was implemented in February of 2003, reducing the Secretariat staff by about 50%. Since the Executive Director's position was among those eliminated, the Board of Governors has stepped in to fill this gap and has taken a much more active role in the management of the Secretariat. Other cost-cutting measures include reducing office space by 37.5% (from 3,438 square feet to 2,146 square feet), and terminating the employee pension plan.

The Secretariat yet again passed its annual year-end audit (conducted in August 2003) without any 'advisory comments' or recommendations for change by the auditor.

4. **Information Technology**

The Secretariat's IT network has remained essentially the same. No major improvements or upgrades have been made, due to a temporary freeze on capital expenditures. However, the existing equipment is serving our needs quite adequately for the time being.

At PTC2003, all attendees were given the opportunity to access the Hilton hotel's 802.11b wireless network. Secretariat IT staff and volunteers manned a wireless help desk to ensure that all who wanted to access the wireless network were able to do so. The popular laptop stop was expanded and the conference e-mail system was used more extensively for contacting attendees and associated networking.

PTC continued the transition to a single server platform. All file and print services and the iMIS membership database have been moved to the Microsoft Windows 2000 platform. The shift in platforms has allowed PTC to greatly reduce reliance on outside agencies for Novell Network support. We have been able to eliminate the monthly service contract (and associated costs) with Busch Consulting while maintaining hardware and software support programs as needed. The current plan is to move the Great Plains Dynamics accounting software in 2004, thus completing the standardization.

In the Secretariat, the majority of unused computer equipment has been sold, with all of the higher-end equipment being retained for the Secretariat staff. Attention has been focused on obtaining software that provides needed functionality at little or no cost, *e.g.*, Virtual Network Computing for telecommuting. An automated system has been implemented to insure all Windows critical system updates are applied in a timely fashion.

Functionality has been enhanced via upgrades to the iMIS Membership Database and Great Plains Dynamics accounting software applications. Progress is being made in controlling spam via an email filtering agreement with Pau Spam.

ANNEX
BOARD OF GOVERNORS   January 2003 – January 2004

Bruce Drake, Anthony Gardiner, Mark Hukill, Meheroo Jussawalla, Hansuk Kim, Eui Koh, David Lassner, William McCaughan, John Pasaribu, Geffry Salmon, Tim Shea, Seiichi Tsugawa, Tao Yun

BOARD OF GOVERNORS   January 2004 – January 2005

Bruce Drake, Anthony Gardiner, Andreas Georghiou, Mark Hukill, Hansuk Kim, David Lassner, William Lin, Richard Nickelson, Kenji Saga, Geffry Salmon, Tim Shea, Seiichi Tsugawa, Robert Walp

附件二：研討會議程

Schedule at a Glance
(Subject to Change)

PTC'04

New Times—New Strategies:
ICT Rising from the Ashes

Sunday
11 January 2004

0800–1545
The Asia-Pac Satellite
Communications Summit

0900–1200
Workshops/Round Tables/
Panels

1030–1600
Exhibits Open

1100–1200
Members' Meeting

1200–1300
Lunch in Exhibit Area

1230–1430
Advisory Council Meeting

1300–1530
Workshops/Round Tables/
Panels

1530–1600
Afternoon Break

1600–1800
Opening Ceremony &
Opening Plenary Session

1800–1930
Opening Reception

Monday
12 January 2004

0715–0800
Speakers' Breakfast

0815–1000
Morning Plenary Session

1000–1030
Morning Break

1030–1200
Concurrent Track Sessions I

1130–1700
Exhibits Open

1200–1330
Lunch in Exhibit Area

1200–1330
Researchers' Lunch

1200–1330
Lawyers' Lunch

1200–1330
Educators' Lunch

1200–1330
Lunch—Commercial Satellite
Launch Services Industry
Panel

1330–1500
Concurrent Track Sessions II

1500–1530
Afternoon Break

1500–1600
Exhibit Reception

1530–1700
Afternoon Plenary Session

Tuesday
13 January 2004

0715–0800
Speakers' Breakfast

0830–1000
Morning Plenary Session

0830–1130
Exhibits Open

1000–1030
Morning Break

1030–1200
Concurrent Track Sessions III

1200–1330
Lunch with Speaker

1330–1500
Concurrent Track Sessions IV

1500–1530
Afternoon Break

1530–1700
Super Sessions

Wednesday
14 January 2004

0715–0800
Speakers' Breakfast

0830–1000
Concurrent Track Sessions V

1000–1030
Morning Break

1030–1200
Morning Plenary Session

1200–1400
Lunch (on own)

1200–1400
Lunch—Satellite Panel

1400–1530
Concurrent Track Sessions VI

1530–1600
Afternoon Break

1600–1730
Closing Plenary Session &
Closing Ceremony

Thursday
15 January 2004

PTC Business Meetings

0800–0945
Membership Committee
Meeting

Research Committee Meeting

1000–1200
Conference Committee
Meeting

1300–1500
Advisory Council Meeting

1300–1730
Board of Governors Meeting

PTC'04 Papers and Program

(Subject to Change)

PTP'04

Sunday
11 January 2004

0800–1545
THE ASIA SATELLITE COMMUNICATIONS SUMMIT

New Satellite Strategies: Shaping the Future of Asia-Pacific's ICT Revolution

Organized by the Global VSAT Forum
(*See complete details in the program insert.*)

Location:
Honolulu 1 / 2 / 3

This Summit will address the fact that while satellite and network operators have made significant contributions to Asia-Pac regional connectivity, they continue to face regulatory obstacles, making even more effective provision of domestic and multi-national services problematic.

The Summit Chair will provide attendees with an opportunity to identify exactly what the manufacturers and service providers have to offer throughout the region, and to assess just exactly how these offerings will facilitate Asia-Pac's continued ICT development over the near- and longer-term.

0800–0830
Registration

0830–0900
Introduction from the Summit Chair

0900–0945
Satellite-based WiFi: Does the "Killer Application" Still Matter?

0945–1030
Executive Roundtable: The Future of Asia-Pac's ICT: New Satellite Strategies, New Network Offerings

1030–1100
Refreshment Break

1100–1200
Effecting Satellite Competition: The Path to the Liberalised Market

1200–1300
Trends & Analysis: VoIP over Satellite

1300–1400
Lunch

1400–1500
New Solutions: The Shape of Satellite Services to Come

1500–1530
Country Market Analyses

1530–1545
Closing Remarks from the Summit Chair

0900–1200
Workshops/Round Tables/Panels

WKS1
Where Do We Go From Here? The Growth, Rebuilding and Restructuring of Asia's Telecommunications Markets

Location:
South Pacific 1

Asia's telecommunications markets have not been immune from the significant capital markets events of the past few years. However, Asia's telecom carriers have operated with lower levels of leverage and more modest stock prices in less competitive markets, and have therefore emerged from this period in a stronger position than many US domestic carriers.

Some of Asia's telecommunications networks and services are among the most developed in the world (including Hong Kong, Singapore, Japan and Korea), while others (such as China and India) represent potentially major domestic markets, if levels of growth can be sustained.

Ironically, at a time when many investors have withdrawn from the region, equity prices are more attractive than at any time in the last few years. Further, many Asian conglomerates have been among the bidders for the assets of US telecom carriers that have made Chapter 11 filings, thereby suggesting that we may see reverse path investments into the US market, although there are also US regulatory hurdles.

How will the investment relationship between the US and Asian telecommunications sectors develop over the next several years?

Investment, Consolidation and Restructuring in Asia's Telecommunications Markets— An Overview
PHILLIP L. SPECTOR, Partner, Paul, Weiss, Rifkind, Wharton & Garrison LLP (PWRW&G), *USA*

The Domestic Restructuring of the PRC Telecommunications Sector and WTO Entry Strategies
JEANETTE CHAN, Partner, PWRW&G, *Hong Kong SAR, China*

New Times—New Strategies: ICT Rising from the Ashes

Japan—An Accelerating Liberalization Process
LISA YANO, Partner, PWRW&G, *Japan*

India—Will it Finally Become a Major Regional Telecommunications Market?
MICHAEL REEDE, Partner, PWRW&G, *Hong Kong SAR, China*

Satellite Networks in Asia
PHILLIP L. SPECTOR, Partner, PWRW&G, *USA*

WKS2
Implementing Voice Over IP

Location:
South Pacific 2

Topics to be covered:

- A cursory review of the integrated VoIP network and the various protocols (PSTN, Broadband, H.323, SIP, etc.).

- Some of the challenges faced by carriers and service providers as it relates to interoperability and conversion.

- Real-world experience and guidance on how those challenges were overcome resulting in significant cost savings (50% in CAPEX, increased service profit margins by 30% and eliminating CDR loss) and the exciting applications that can now be realized by implementing a session controller based VoIP network architecture.

Target participants include technical and non-technical members who wish to learn more about the benefits of implementing a voice-over Internet Protocol (VoIP) solution.

Presenter:
RICH FRIZZELL, Director of Technical Services, NexTone Communications, *USA*

PTC'04 Papers and Program

(Subject to Change)

WKS3

Solving the Spam Problem

Location:
South Pacific 3

Spam is the Internet's #1 problem today. Forbes magazine recently reported some shocking numbers: 4.9 trillion spam messages will be sent and 45% of all email is spam. For ISPs, the problem is even worse: Spam is ISP customer service complaint number one and the reason behind most subscriber churn. Nearly half of Americans (49 percent) change an e-mail address annually and NFO WorldGroup found 64 percent of personal e-mail address changes are due to spam and/or an ISP switch.

Any public discussion about what spam is and what it is not will quickly discover that no one can specifically agree on what spam is. However, everyone generally agrees that spam is email that a given individual does not want. The Internet's standards groups (including the Anti-Spam Research Group (ASRG), Internet Research Task Force (IRTF), Internet Engineering Task Force (IETF) and the Internet Society (ISOC) have categorized the problem as "consent-based communication." Consent-based communication implies that the end-user can set policies that describe the conditions on how, when, and who can send them email. This is a paradigm-shift from today, which for the most part unconditionally accepts all properly-addressed emails.

Attendees of this workshop will:

- Discuss, debate, and develop a rich understanding of the current spam problem

- Review a taxonomy of current anti-spam approaches along with their pros and cons

- Understand the current development of consent-based communication standards as defined by the ASRG

- Share and discuss direct experiences with various anti-spam approaches

- Develop a framework for understanding and evaluating anti-spam proposals, especially within the context of consent-based communication

- Understand best practices that can be implemented to reduce current and future spam for both end-users and system administrators

The intended audience for this workshop is:

- Executives and managers that need to develop a clear understanding of the spam problem and potential solutions

- Technical staff that need to understand the details of the pros and cons of various anti-spam technologies

- Those tasked by their organizations to assess and solve the spam problem

Presenter:
PETER KAY, President, Titan Key Software, LLC, USA

WKS6

Prepaid Cellular: Past, Present and Future

Location:
South Pacific 4

Prepaid cellular is one of the fastest growing and hottest segments in the telecommunications industry. The Pelorus Group estimates that this market will grow to almost $20 billion in revenues by 2006. Even though this is a very hot market, there are many ways that prepaid cellular services can be provided to end users and everyone is searching for the best ways.

The attendees will be instructed on the following points:

- Commonly used cellular industry terms
- Different methods of delivering prepaid cellular solutions
- Trend and needs of service providers
- Defining products to meet the needs of users
- Elements you need to control within your products and business
- How to make your offered products unique
- Creating customer loyalty though your services

The intended audience for this workshop is:

- Current cellular network operators
- Current or future competitors to current cellular providers
- Current or future resellers of cellular products
- Prepaid calling card providers

Presenters:
GARY BROWN, Chief Technical Officer, NACT Telecommunications Inc., USA

BRETT PARKINSON, VP Business Development, NACT Telecommunications Inc., USA

1030–1600
Exhibits Open

Location:
Tapa 1 / 2 / 3

1100–1200
Members' Meeting

Location:
Coral 1 / 2

1200–1300
Lunch in Exhibit Area

Location:
Tapa 1 / 2 / 3

1230–1430
Advisory Council Meeting

Location:
Coral 1 / 2

1300–1530
Workshops/Round Tables/Panels

WKS4
Venture Capital Strategies in China

Location:
South Pacific 1

Given the wide gap between law and practice for foreign investment in China's telecoms sector, the tutorial will provide a unique view on how deals are really being done in China, based on the author's personal knowledge of various high-profile transactions.

The aim of the tutorial is to give potential participants in China's telecoms market a flavor of the political/economic background and legal/regulatory risks, which are commonly encountered in this dynamic but highly regulated sector.

Target participants include global network carriers, venture capital firms and other potential investors in China's telecom sector, particularly those seeking to identify investment opportunities amongst privately-held SMEs in the Internet/VATS space.

Topics to be covered:

- Introduction to regulatory background

- Case study. Does it work? Successful examples currently being tolerated. Will there be another clampdown?

Presenter:
EMMA DAVIES, Senior Associate, Clifford Chance,
People's Republic of China

WKS5
...nsuring a Smooth Migration to Packet Voice

Location:
South Pacific 2

Now proven in large-scale commercial deployments, packet voice technologies are changing the business landscape for telecommunications companies around the world.

A migration to packet voice can both substantially reduce the cost of service and also provide a number of advantages that enable carriers to compete more effectively in the global telecommunications market. In this session, executives from Sonus Networks, a leading provider of voice infrastructure solutions for the new public network, will address the following topics, among others:

- What are the major benefits from deploying a packet voice infrastructure?

- What are the major technology choices for deploying packet voice, and the key characteristics of each?

- What is required to deliver the same level of services in this new model?

- How can carriers leverage a single architecture to deliver all types of services—local and long distance?

- How can packet voice technologies be introduced into an existing network without disrupting the legacy infrastructure?

- How do IP-based enhanced services provide opportunities to develop new revenue streams?

- What are the technical, market and regulatory challenges facing carriers deploying packet voice services?

Presenter:
BOB DYE, Vice President, Strategic Marketing and Business Development, Sonus Networks, *USA*

RT1
Federation Of Regional Associations (FORA)

Location:
South Pacific 3

This round table meeting continues a twenty year long effort on the part of PTC to stimulate dialog among the many non-profit organizations concerned with communication issues in the Pacific hemisphere. A current directory is available online at: www.ptc.org. Informal meetings of the directors of such organizations have been held in conjunction with the annual PTC conference in Honolulu in January and the annual CommunicAsia meeting in Singapore in June. The title of Federation Of Regional Associations (FORA) has been adopted.

The focus for the upcoming round table will be on the role of the Internet in the management of our respective organizations and the applications of the Internet and other ICTs to address a common problem; the bridging of the digital divide. How can the non-profits assist or lead in this global effort? What role do such organizations have in consensus building? How can we work together to facilitate positive actions in this regard?

Current participants include:

DICK BARBER, Senior Advisor of External Relations, Pacific Telecommunications Council *[Headquartered in USA]*

ERNIE NEWMAN, Chariman, International Telecommunications Users Group (INTUG) and Chief Executive, Telecommunications Users Association of New Zealand (TUANZ), *New Zealand*

MICHAEL CALVANO, Head, Regional Office for Asia and Pacific, ITU *[Headquartered in Thailand]*

JOHN JANOWIAK, Director, International Engineering Consortium *[Headquartered in USA]*

SALMA JALIFE, Chair of APEC-TEL and Senior Consultant to the Telecommunications Authority, *México*

PAUL WILSON, Director General, Asia Pacific Network Information Centre, *Australia*

SAVENACA VOCEA, Research and Liaison Officer, Pacific, Asia Pacific Network Information Centre, *Australia*

ANIL PRAKASH, Secretary General, ITU-APT Foundation of India *[Headquartered in India]*

PTC'04

New Times—New Strategies:
ICT Rising from the Ashes

RT2
Afghanistan and Iraq Round Table

Location:
Hibiscus 1

The return of Afghanistan and Iraq to safe and productive civil societies depends on effective telecommunications. Afghanistan's national network has been devastated by 23 years of war. In Iraq, network facilities were targeted with pinpoint accuracy during the 2003 conflict. Each must develop comprehensive reconstruction strategies. In this round table, two PTC members share first-hand knowledge of efforts underway to create an all-new digital infrastructure from the ruins of war.

PTC Advisory Board member KEN ZITA has served as the principal U.S. telecommunications advisor to the Afghan government since early 2002. He prepared the *Telecommunications National Development Strategy*, the *Telecommunications and Internet Policy*, and several international tenders for network equipment and services.

JAKE MacLEOD, Principal Vice President and CTO for Bechtel Telecommunications, was amongst the first to appraise the reconstruction needs on the ground. Bechtel Telecommunications has been tasked by the Coalition Provisional Authority and USAID to direct emergency network restoration.

This round table will provide a briefing on legislative and commercial events in both countries, and technological solutions being considered for future network solutions.

PAN1
Eliminating the Digital Divide: How?

Location:
South Pacific 4

Collaboration between the Pacific Telecommunications Council and the IEEE Communications Society

In this era of advanced telecommunications, vast number of people have limited, if any, access to adequate services. Although the essential importance of communicating is universally acknowledged, global development has been skewed toward the affluent regions. This session will explore ways to develop service in less served areas, drawing examples from established and planned systems. Factors such as

PTC'04 Papers and Program

(Subject to Change)

standards for new services, facilities and personnel requirements, costs, revenues and means of implementation, will be discussed by panelists with extensive experience in global developments and who have implemented significant service improvement in underdeveloped areas.

Each panelist will present information on implementation projects based upon personal experience, dealing with specific aspects of telecommunication development. Additionally, data regarding costs in relation to level and quality of service and means for meeting them will be presented and discussed in the context of experience gained in the developed countries. Time will be allocated for the panelists to interact with the audience to explore means for attaining progress.

Moderator:
ROBERT WALP, President and Chairman Emeritus, GCI, *USA*

Panelists include:
MARTIN CARY, Vice President, Broadband Services, GCI, *USA*

RONALD G. CHOURA, State Executive, Michigan Department of Consumer & Industry Services, Public Service Commission, Communications Division and Professor, Michigan State University, Department of Telecommunications, *USA*

ANTHONY C. GARDINER, President, Kensar Telecommunications Ltd., *Canada*

PAUL M. HARTMAN, Director, Regulatory/Education, Beacon Telecommunications Associates, *USA*

HEATHER E. HUDSON, Director, Telecommunications Management and Policy Program, School of Business and Management, University of San Francisco, *USA*

1530–1600
Afternoon Break

1600–1800
Opening Ceremony & Opening Plenary Session

Location:
Coral 4 / 5

Opening Ceremony

Convenor:
BRUCE DRAKE, Vice President, Board of Governors and PTC'04 Conference Chair, Pacific Telecommunications Council

Welcoming Remarks:
HANSUK KIM, President and Chairman, Board of Governors, Pacific Telecommunications Council

MARK LOPIANOWSKI, Chair of Advisory Council and PTC'04 Program Chair, Pacific Telecommunications Council

THE HONORABLE LINDA LINGLE, Governor, State of Hawaii, *USA*

Opening Plenary Session
Theme: When the Going Gets Tough

Moderator:
DAVID McCLAIN, Vice President for Academic Affairs, University of Hawaii, *USA*

Speakers:
JOHN J. LEGERE, CEO, Global Crossing Ltd., *USA*

FRED M. BRIGGS, President, Operations and Technology, MCI, *USA*

OLOF LUNDBERG, *UK*

MICHIO FUJISAKI, CTO, Fujitsu Limited and President, Fujitsu Laboratories Limited, *Japan*

1800–1930
Opening Reception

Location:
Coral 1 / 2 / 3

Co-Sponsored by:

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PTC'04 Papers and Program

(Subject to Change)

Monday

12 January 2004

0715-0800
Speakers' Breakfast

Location:
Bali Restaurant

0815-1000
Morning Plenary Session

Location:
Coral 1 / 2

Presentation of the PTC Essay Price 2003 Award
BINGCHUN MENG, Student, College of Communications, Pennsylvania State University, *USA*

(Bingchun Meng will deliver her award winning paper in session M.1.5)

Theme: Security

Moderator:
ROGER T. NAFF, Director—Market Development, Boeing Homeland Security and Services, *USA*

Speakers:
AMBASSADOR DAVID A. GROSS, U.S. Coordinator, International Communications and Information Policy, U.S. Department of State, *USA*

MICHAEL BINDER, Assistant Deputy Minister — Spectrum, Information Technologies and Telecommunications, Industry Canada, *Canada*

WILLIAM C. BONI, Vice President & Chief Information Security Officer, Motorola Information Protection Services, *USA*

1000-1030
Morning Break

Sponsored by:

comindico

1030-1200
Concurrent Track Sessions I

M.1.1

Reflating Revenues and Margins (Business Models)

Location:
South Pacific 1

Chair:
ROBERT FRIEDEN, Pioneers Chair in Telecommunications and Professor, Pennsylvania State University, *USA*

M.1.1.1
Business Models for Successful Revenue Implementation
JEAN-FRANÇOIS THOMAS, Vice President, Asia, Networks and Carriers, *Hong Kong SAR, China*

M.1.1.2
Getting Out of the Doldrums — Telcos Can Become Growth Stocks Again
JACKSON KAM, Principal Consultant; ALAN YOUNG; CARL CHEUNG; JEREMY GODFREY, Member of PA's Management Group and VIRAT PATEL, Managing Consultant, PA Consulting Group, *Hong Kong SAR, China*; and GUY TEMPLETON, Member of PA's Management Group, *Australia*

M.1.1.3
Managing a Network on a Shoestring Budget —Sustainable Advantage or Stressing the Network?
PETE BARLETTO, Managing Director, Network Services and Operations, Tyco Telecommunications, *USA*

Presenter:
WILLIAM MARRA, Vice President — Research, Development and Network Operations, Tyco Telecommunications, *USA*

M.1.1.4
An Internet for Transactions — A User Perspective to Inform Future Business Models
REG COUTTS and TREVOR BARR, Smart Internet Technology Cooperative Research Centre, *Australia*

M.1.2

Alternatives for the Last Mile

Location:
South Pacific 2

Chair:
JEY K. JEYAPALAN, Dr. Jeyapalan & Associates, LLC, *USA*

M.1.2.1
Satellite DOCSIS
MARK DANKBERG, Chairman and CEO, ViaSat, Inc., *USA*

M.1.2.2
NTT's Fixed Wireless Access System Using Quasi-Millimeter Band
HIDEYUKI MARUYAMA, Senior Research Engineer; MITSUHIRO BABA, Senior Research Engineer and Supervisor, FWA Development Project, First Promotion Project, NTT Access Network Service Systems Laboratories, NTT Corporation, *Japan*

M.1.2.3
Is There Life in 3G? The Dark Horse of TDD
PETER WATERS, Partner, Gilbert+Tobin and Associate, Arculli and Associates and ANTHONY SYLVESTER, Partner, Gilbert+Tobin and Associate, Arculli and Associates, *Hong Kong SAR, China*

Discussant:
KEN ZITA, Managing Partner, Network Dynamics Associates, LLC, *USA*

M.1.3

Adoption of Telemedicine and Other Services

Location:
South Pacific 3

Chair:
WILLIAM McCAUGHAN, Dean, OSU Extended Campus, *USA*

M.1.3.1
Rural Telemedicine: Lessons from Alaska for Developing Regions of the Asia-Pacific
HEATHER E. HUDSON, Director, Telecommunications Management and Policy Program, University of San Francisco, *USA*

M.1.3.2
Industry Adoption of Mobile Data Services: Towards a Framework of Analysis
ELIZABETH FIFE and FRANCIS PEREIRA, Center for Telecom Management, Marshall School of Business, University of Southern California, *USA*

M.1.3.3
Barriers and Drivers of On-line Medical Applications: A View from the Health Industry
LUCY FIRTH, Lecturer and PETER FRANCIS, Associate Lecturer, University of Melbourne; and DAVID MELLOR, Senior Lecturer, School of Psychology, Deakin University, *Australia*

M.1.4

International/Regional Policy for ICT Development

Location:
South Pacific 4

Chair:
MICHAEL JANIGAN, Executive Director and General Counsel, Public Interest Advocacy Centre, *Canada*

M.1.4.1
Promoting Private and Public Investment Through Trade Liberalization
LAURA B. SHERMAN, Legal Representative and Advisor, *USA*

M.1.4.2
***Considerations in Utilizing ODA/OOF Schemes for Information and Communication Technology (ICT) of Developing Countries in Asia-Pacific**
KOUSUKE DOBASHI, Manager, Global Business Development Group, Business Planning and Administration Division, Administration Department, Fujitsu Limited, *Japan*

M.1.4.3
I.T. & Telecommunications in Mutual Support for India's Human & Economic Development
T.H. CHOWDARY, Director, Center for Telecom Management and Studies and IT Advisor, Government of Andhra Pradesh, *India*

M.1.4.4
Village Jumps Over the Wall — The Right Recipe to Help China's Rural Communities Cross the Digital Divide
BERNARDINE LAI, Associate, Arculli and Associates and PETER WATERS, Partner, Gilbert+Tobin and Associate, Arculli and Associates, *Hong Kong SAR, China*

M.1.5

China Continues

Location:
Honolulu 1 / 2 / 3

Chair:
PHILIP BOSSERT, Executive Director & CEO, High Technology, Development Corporation (Hawaii), *USA*

Still high GDP growth, even after SARS. Still so confusing even after WTO. What's really going on in that country? Let's hear from the business people about the Chinese market—their stories, their models and their ambitions.

Speakers:
XIAO YAN LI, General Manager, Greater China, China Netcom Corporation Ltd., *People's Republic of China*

Carrier Hotel in China
WILLIAM LIN, CEO, Dragon Telecom, *People's Republic of China*

WiFi in China
DUNCAN CLARK, Managing Director, BDA China Ltd., *People's Republic of China* and ERIC HARWIT, Associate Professor, Asian Studies, University of Hawaii, *USA*

Infrastructure, Service and Trust: Assessing the Environment of E-commerce in China
BINGCHUN MENG, College of Communications, Pennsylvania State University, *USA*

1130–1700

Exhibits Open

Location:
Tapa 1 / 2 / 3

1200–1330

Lunch in Exhibit Area

Location:
Tapa 1 / 2 / 3

1200 – 1330

Researchers' Lunch

Location:
Kahili 2

1200–1330

Lawyers' Lunch

Location:
Rainbow 1/2

1200–1330

Educators' Lunch

Location:
Kahili 1

1200–1330

Lunch—Commercial Satellite Launch Services Industry Panel

Location:
Lehua Suite

New Launch Services requirements are being met on shorter lead times and at lower costs. Satellite makers are fighting for survival and lowering costs. Yet, nearly all of them have experienced satellite failures after spacecraft have reached their orbital location. Both satellite owners and insurance underwriters are becoming increasingly concerned about the cost and availability of satellite insurance.

These Commercial Satellite Launch Industry issues will be the focus of the 2004 panel discussion and will set the stage for an interesting, informative and heated debate. Each panel member will be asked to address the current issues faced by the satellite and launch industry for the coming year.

Panel Chair:
ED WARD, President, Ed Ward & Associates, Inc., *USA*

Panelists:
TED McFARLAND, Vice President-Asia Pacific, International Launch Services, *USA*

PHILIPPE BERTEROTTIERE, Vice President, Sales and Marketing, Arianespace, *France*

ROBERT PECKHAM, International Sales Director, Boeing Launch Services, *USA*

ISAO YAMAZAKI, H-2A, Executive Chief Engineer, Mitsubishi Heavy Industries, Ltd., *Japan*

1330–1500

Concurrent Track Sessions II

M.2.1

Reflating Revenues and Margins (Product Focus)

Location:
South Pacific 1

Chair:
GEORGE J. LISSANDRELLO, Chief Operating Officer, Wine Network Inc., *USA*

M.2.1.1
The Asian Market for Satellite Transponders: What Does Transponder Overcapacity Mean for Asia?
GREG CARESSI, Vice President, Communication Services and KARIM NOUR, Research Analyst, Satellite Communications, Frost & Sullivan, *USA*

M.2.1.2
Bandwidth Value — Pricing as Part of a Broader Business Strategy
MICHAEL RIEGER, Vice President — Sales and Marketing and ANDREW KOWALIK, Director — Marketing and Strategic Planning, Tyco Telecommunications, *USA*

M.2.1.3
The Broadband Impact and Emerging Applications in South-Korean Market: Based on the Case of KT
MINZHEONG SONG, Senior Researcher, Korea Telecom, *Republic of Korea*

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PTC'04

New Times—New Strategies:
ICT Rising from the Ashes

M.2.1.4
Australian Broadband Strategies — Putting Broadband Take Up in Context
CAROLINE LOVELL, Partner and TOBY RYSTON-PRATT, Paralegal, Clayton Utz, *Australia*

Presenter:
JANE FORSTER, Partner, Clayton UTZ, *Australia*

M.2.2
Broadband Applications and Content Delivery

Location:
South Pacific 2

Chair:
PETER LOKO, Managing Director, Pacific Mobile Communications, *Papua New Guinea*

M.2.2.1
Is the Internet Mobile? Measurements from Asia-Pacific
MICHAEL MINGES, Head of Market, Economics and Finance Unit, Telecommunication Development Bureau, International Telecommunication Union *[Headquartered in Switzerland]*

M.2.2.2
Service Control in Broadband Networks
YUVAL SHAHAR, Co-Founder, President and CEO, P-Cube Inc., *USA*

M.2.2.3
Large Bandwidth Applications - Are They for Real? When Are They Coming?
JACQUES GROS, Distinguished Member of Technical Staff — Network Forecasting, Tyco Telecommunications, *USA*

M.2.3
Transformational Applications

Location:
South Pacific 3

Chair:
LOUIS FOX, Vice Provost for Educational Partnerships and Learning Technologies, University of Washington, *USA*

M.2.3.1
Remote Collaboration for City Planning
NOBUYOSHI TERASHIMA, Professor and KATSUJI HIRATA, PhD Candidate, Graduate School of Global Information and Telecommunication Studies, Waseda University, *Japan*; JOHN TIFFIN, Professor, Emeritus and LALITA RAJASINGHAM, Senior Lecturer, Victoria University of Wellington, *New Zealand*; and ANNE GOOLEY, Executive Director, The Queensland Open Learning Network, *Australia*

M.2.3.2
Satellite Broadband Revolution: From Priming Gas Pumps to Connecting Schools
KENG-JIN LIAN, Marketing Director, Hughes Network Systems, *USA*

M.2.3.3
Supporting Telework Over the Broadband Internet in Japan
KENJI SUGAWARA, Professor, Department of Information and Network Science, Chiba Institute of Technology; NORIMASA YOSHIDA, Executive Director and SHINICHIRO TAGAWA, Senior Research Fellow, Japan Telework Association, *Japan*

M.2.3.4
ViaHub: The Biggest Supply Chain Community Service Hub in Chinese Taipei
GARY GONG, Vice President and General Director, Advanced e-Commerce Institute; TERESA (MEI-HUA) LIN, Deputy Managing Director, e-Commerce Resource Center; PO-HUI LIANG, MIS Manager, e-Commerce Resource Center; and VINCENT HU, Senior Manager, e-Commerce Resource Center, Institute for Information Industry, *Chinese Taipei*

M.2.4
Stakeholders' Alliance for the Development—What Can We Do in Asia-Pacific?

Location:
Honolulu 1 / 2 / 3

Organized by the PTC Special Interest Group on Developing Countries (SIG on DEV)

Chair:
YOSHIKO KURISAKI, Convenor, PTC Special Interest Group on Developing Countries

Key questions:
- How should stakeholders for the development efficiently work together?

- What are obstacles of the stakeholders' alliance and what are the solutions?

- How do stakeholders work most efficiently with international organizations for the development projects?

Speakers:
Telecenters and Distance Education — Wish List to the Government, Network and Service Provider, Communications Scholars, Educator and International Agencies
NASWIL IDRIS, Professor in Communication Studies, Universitas Professor Dr Moestopo Beragama and Member of MASTEL (Indonesian Infocom/ICT Society), *Indonesia*

Response from a Telecommunications Policy Maker
GEFFRY SALMON, Director General, Office des Postes et Telecommunications (OPT), *French Polynesia*

Lessons from the International Development Community
HARUKO HIROSE, Managing Director, United Nations Industry Development Organization (UNIDO), *Austria*

Roles of the Private Sector
JOAN ABRAMSON, Government Contract Manager, Hokupa'a Technologies, Inc., *USA*

Funding by the Private Sector
SEIICHI TSUGAWA, Head of International Organizations & International Affairs, KDDI CORPORATION, *Japan*

Lessons from Stake Holders Alliance in the Pacific Islands
SAM TAUFAO, IT Manager, The Secretariat of the Pacific Community, Noumea, *New Caledonia*

M.2.5
Youth Panel: Meet Your Future Today

Location:
South Pacific 4

Chair:
MICHAEL CALVANO, Head, Regional Office for Asia and Pacific, ITU *[Headquartered in Thailand]*

"Our vision is a world in which the digital divide has been bridged, where communication is a fundamental right, a world where we become closer in a global human network." This is the collective youth vision, expressed at the Inaugural ITU Asia 2002 Youth Forum. The Forum brought together 76 youths from forty countries in Asia and the Pacific to learn about and discuss development of ICTs in the region. Five representatives from the alumni of this Forum come together in an all-youth panel to talk about their involvement in activities aimed at increasing ICT literacy and ICT inclusivity in the Asia-Pacific region. The panel will highlight a project, "The Asia-Pacific Youth Teleconference," which has been a joint development effort of some of the Youth Forum alumni.

PTC'04 Papers and Program

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Featuring the following papers:
Meet Your Future Today
Asia-Pacific Teleconference
Human Network Initiative

Speakers include:
LISA THURSTON, Student, Information Technology, University of South Australia, *Australia*

AYESHA RAUF, Student, Electrical Engineering, University of Engineering & Technology, Peshawar, *Pakistan*

CLARRY SHCHIGLIK, Student, Information Systems and Accounting, Victoria University of Wellington, *Australia*

XIN ZHAO, Student, Management Information Systems, Nanjing University of Posts & Telecommunications, *People's Republic of China*

DMITRY EPSTEIN, Student, Innovative Media and Communications, Ben-Gurion University of the Negev, *Israel*

1530–1700
Afternoon Plenary Session
Theme: Regulated Markets

Location:
Coral 1 / 2

Moderator:
RICHARD BEAIRD, Senior Deputy Coordinator, International Communications and Information Policy, U.S. Department of State, *USA*

Speakers:
VIRGILIO PEÑA, Undersecretary for ICT, Department of Transportation and Communication, *Philippines*

SALMA JALIFE, Chair of APEC-TEL and Senior Consultant to the Telecommunications Authority, *México*

1500–1530
Afternoon Break

1500–1600
Exhibit Reception

Location:
Tapa 1 / 2

PTC'04 Papers and Program
(Subject to Change)

PTC'04

Tuesday

13 January 2004

0715–0800
Speakers' Breakfast

Location:
Bali Restaurant

0830–1000
Morning Plenary Session
Theme: Reaching More People /
The Ubiquitous Society

Location:
Tapa 1

Moderator:
ROBERT Y.L. MAO, President & CEO, Nortel
Networks China, *People's Republic of China*

Speakers:
TADAO SAITO, Professor, Chuo University and
Professor Emeritus, The University of Tokyo,
Japan

NOAH SAMARA, Chairman and CEO,
WorldSpace Corporation, *USA*

TADASHI ONODERA, President, KDDI CORPO-
RATION, *Japan*

DALE CRIPPS, Publisher, HDTV Magazine, *USA*

0830–1130
Exhibits Open

Location:
Tapa 1 / 2 / 3

1000–1030
Morning Break

1030–1200
Concurrent Track Sessions III

T.1.1
The Voice Business

Location:
South Pacific 1

Chair:
GEORGE E. DARBY, President, Darby Law
Corporation, *USA*

T.1.1.1
Business Strategies in Maturing Voice Market
PETER FALSHAW, Director of Consulting, Ovum Pty
Ltd, *Australia*

T.1.1.2
The Third Wave of VoIP: Addressing the
Needs of Incumbent Carriers
ARI RABBAN, Vice President of Corporate
Development and Marketing, VocalTec
Communications, *USA* and ISHAI ROSMARIN,
President, VocalTec Communications Deutschland
GmbH, *Germany*

T.1.1.3
The Demise of Voice Revenue Has Been
Greatly Exaggerated
JUSTIN MALLEN, CEO, Silk Road Technologies,
People's Republic of China

T.1.2
The All-IP Network

Location:
South Pacific 2

Chair:
KEN ZITA, Managing Partner, Network Dynamics
Associates, LLC, *USA*

T.1.2.1
Next Generation of Wireless Access System
— IP PCS
PETER WANG, President & CEO, China Quantum
Communications Limited, *USA*

T.1.2.2
MPLS: Driving Carrier Adoption of Optical
Ethernet
NAN CHEN, Vice President of Marketing, Atrica Inc.,
USA

T.1.2.3
GigE on a Global Basis — Ways to Make It
Happen
JACQUES GROS, Distinguished Member of Technical
Staff — Network Forecasting and ANDREW KOWALIK,
Director — Marketing and Strategic Planning, Tyco
Telecommunications, *USA*

T.1.2.4
New Rules for Deploying Service Provider
Packet Networks in the 21st Century Economy
KAMBIZ HOOSHMAND, Vice President and General
Manager, Carrier Core Multiservice Business Unit
(CCMSBU), CISCO Systems, Inc., *USA*

T.1.2.5
Transformational Technologies and
Convergence
PHIL EDHOLM, Chief Technology Officer and Vice
President of Network Architecture, Nortel Networks
Enterprise Networks, *Canada*

T.1.3
Policy, Regulation and Ethics

Location:
South Pacific 3

Chair:
SALLYE CLARK, Senior Director, International Affairs
and Senior Counsel, PanAmSat, *USA*

T.1.3.1
New Times: New Ethics Strategies
THOMAS COOPER, Professor, Visual and Media Arts,
Emerson College and Co-Publisher, MEDIA ETHICS
magazine, *USA*

T.1.3.2
Building Online Users' Confidence by the
SPLC Framework in Information Systems
JOHN AYOADE, Research Fellow, Emergency
Communications Group, Communications Research
Laboratory, *Japan*

T.1.3.3
Legal Analysis of Digital Must-Carry Rules
YA-HUI LIN, Shih Hsin University, *Chinese Taipei*

T.1.3.4
Are Telecommunications Regulations and
Policies Able to Accommodate the Rapid
Development in Technologies? A
Comparative Study of Regulations Adopted in
Selected Countries in Asia, Europe and the
Pacific Island Nations.
MICHELLE CHAN, Senior Associate, Asian
Communications, Media and Technology Group,
Clifford Chance, *Hong Kong SAR, China*

T.1.4
An Analysis of the Satellite Industry's
New Reality

Location:
Honolulu 1 / 2 / 3

Organized by World Teleport Association

Sponsored by:

ANDREW.

PTC'04 Papers and Program

(Subject to Change)

Moderator: LOUIS A. ZACHARILLA, Director of Global Development, World Teleport Association, *USA*

This session will explore the new reality of the market through a discussion with representatives from each segment of the industry. What changes have been real and lasting? What has the industry done in tough economic times to prepare for a better future? How will these changes shape the future for carriers, broadcasters, ISPs and enterprises in Asia?

Speakers include:
KEVEN CAHOON, Vice President—Enterprise Services Group, Globecast, *USA*

AMER KHOURI, Vice President, Marketing, INTELSAT *[Headquartered in USA]*

JON KIRCHNER, Vice President, Strategic Product Marketing, Loral Skynet, *USA*

RON SAMUEL, COO, EUTELSAT *[Headquartered in France]*

T.1.5
Digital Media Technology

Organized by The State of Hawaii, Sony Hawaii Company, and the High Tech Development Corporation

SONY

Location:
Coral 1 / 2

Moderator:
CHRISTOPHER LEE, Chairman, Academy for Creative Media, University of Hawaii and former President of Production for TriStar Pictures and Columbia Pictures, *USA*

Technology Presentation: e-Cinema
MR. MORIKAWA, Senior Vice President, B & P Co., Sony Corporation, *Japan*

Panelists:
JUN AIDA, President, Gaga Production Company, *Japan*

YAIR LANDAU, Co-Chairman, Sony Pictures Entertainment, *USA*

KEN MUNEKATA, Deputy President and Representative Director, Sony Pictures Entertainment Inc., *Japan*

1200-1300
Luncheon

Location:
Coral 3 (Seating limited to 300 PTC delegates overflow in Nautilus 1/2

Sponsored by: **SONY**

Greetings:
THE HONORABLE LINDA LINGLE, Governor, The State of Hawaii, *USA*

Keynote Address:
KUNITAKE ANDO, President and Group Chief Operating Officer, Sony Corporation, *Japan*

1330-1500
Concurrent Track Sessions IV

T.2.1
Obsessions with Assets

Location:
South Pacific 1

Chair:
JAGADISH B. RAO, Consultant, East West Alliance, Inc., *USA*

T.2.1.1
Regulatory Obsession with Infrastructure
JIM HOLMES, Principal Consultant, Ovum Pty Ltd, *Australia*

T.2.1.2
New Models for Asset Ownership in a Capital Constrained Environment
SCOTT DAVIES, CEO, Macquarie Communications Infrastructure Group, *Australia*

T.2.1.3
Maintenance Options for All
PHIL HART, Senior Product Development Manager, Global Marine Systems Limited, *UK*

T.2.1.4
Regulatory and Business Challenges and Opportunities Created by Building a New "Fiberline" Phone System in Hawaii
DANIEL C. SMITH, Graduate Student, Communication and Information Sciences PhD Program, University of Hawaii at Manoa, *USA*

T.2.2
Location-based Services

Location:
South Pacific 2

Chair:
RAY K. TSUCHIYAMA, Director of Business Development —Asia/Pacific, AOL Mobile/Time Warner, Inc., *Japan*

T.2.2.1
New Strategies for Location-based Services
SOICHIRO YANAGIDA, 2nd Systems Department, Mobilefone Solutions Division, NEC Corporation, and SHIGENORI KARIYA, 1st Systems Department, Network Solution DIvision, NEC Communication System Corporation, *Japan*

T.2.2.2
Location-based Services: A Real World Example in the Japanese Gas Utility Sector
TAKASHI TADA, Fujitsu Limited, *Japan*

T.2.2.3
Mobile Games: Opportunities for Service Operators
SCOTT NISBET, Founder and CEO, MobileEclipse, *USA*

T.2.3
Distance Ed — Collaboration

Location:
South Pacific 3

Chair:
BARRY BROWN, Professor, University of Saskatchewan, *Canada*

T.2.3.1
Automatic Recording and Streaming of Synchronous Distance Education Classes
T. CRAIG MONTGOMERIE, Professor, Division of Technology in Education; ALAN DAVIS, Systems Analyst, Division of Technology in Education; and RAJ BOORA, Department of Educational Psychology, University of Alberta, *Canada*

T.2.3.2
Emerging Developments in Collaborative Networking
JAY E. GILLETTE, Professor of Information and Communication Sciences, Center for Information and Communication Sciences, Ball State University, *USA*

T.2.3.3
Cross-Cultural Learning Experiments Through the Utilization of the Transpacific IP Network
NOZOMU NISHINAGA, Researcher, Communications Research Laboratory, *Japan*; YURI NISHIHORI, Professor, Research Division of Media Education, Information Initiative Center, Hokkaido University, *Japan*; KEIZO NAGAOKA, Professor, R&D Department, National Institute of Multimedia Education, Ministry of Education, *Japan*; KENJI TANAKA, Senior Researcher, Communications Research Laboratory, *Japan*; SHIGETO OKABE, Professor, Research Division of Media Education, Information Initiative Center, Hokkaido University, *Japan*; YUICHI YAMAMOTO, Assistant, Research Division of Media Education, Information Initiative Center, Hokkaido University, *Japan*; YOSHIHIRO ICHIOKA, Special Advisor, Obayashi Corporation, *Japan*; LARRY LEIFER, Professor, Stanford Center for Design Research, Stanford University, *USA*; and DALE A. HARRIS, Professor, Stanford University, *USA*

The Transformation of Teaching and Learning in Rural Areas and Small Island States
HILDA C. HEINE, Scholar, Freely Associated States Education, Pacific Resources for Education and Learning (PREL) and DANIEL C. SMITH, Graduate Student, Communication and Information Sciences PhD Program, University of Hawaii at Manoa, *USA*

T.2.4

Rural Telecommunications

Location:
Lehua Suite

Chair:
WINSTON THOMPSON, CEO, Telecom Fiji Limited, *Fiji*

T.2.4.1

Towards Responsive Development for Rural ICTs
SIDDHARTHA RAJA, PhD Student, Department of Speech Communication, University of Illinois at Urbana Champaign and GAURESH RAJADHYAKSHA, Graduate Student, Department of Electrical and Computer Engineering, University of Texas at Austin, *USA*

T.2.4.2

Access Internet and Email Without Personal Computer as Alternative Solution for Rural Telecommunication in Indonesia
GATI CAHYO HANDOYO, Engineer, Rural Communication Laboratory, R&D Division, PT. Telekomunikasi Indonesia, Tbk, *Indonesia*

T.2.4.3

ICT for Rural Community Development
EKANATH KHATIWADA, Business Development Service Advisor, Rural Enterprises Assistance Program, Netherlands Development Organization, *Nepal*

T.2.4.4

Think Innovation, Think Broadband
BILL GRAHAM, Director—International Telecommunications Policy Coordination, Industry Canada, *Canada*

T.2.5

Are Satellites the Backbone of the "Intelligent Community" in Asia?

Location:
Honolulu 1 / 2 / 3

Moderator:
JOHN G. JUNG, Chairman, Intelligent Community Forum, *USA*

Geography dictates that satellites will play a central role in the broadband infrastructure of Asia. The vast land masses, mountainous regions and island nations—eager for economic growth—make satellites a critical part of Asia's ICT network. True economic development does not arise simply from transmission technology. It is in the creation of a "culture of use" for broadband technology that cities and regions transform themselves into Intelligent Communities. This session will explore the role of the satellite transmission industry in this new, exciting and potentially lucrative area.

Speakers:
Intelligent Communities: It's Time for Action
PATRICK AGNIERAY, Director of Marketing, Alcatel Space, *France*

The Intelligent Community Needs Satellite Knowledge Workers
BRUCE R. ELBERT, President, Application Technology Strategy, Inc., *USA*

ELIAS ZACCACK, Vice President, International Sales, SES Americom, Inc., *USA*

Enabling Modern Telecommunication Sevices via Internet Protocol and Satellite Technology
STEPHEN C. YABLONSKI, Senior Vice President — Sales, Marketing and Product Development and STEVEN SPREIZER, Globecomm Systems Inc., *USA*

T.2.6

Visitor Industry Technology

Organized by The State of Hawaii, Sony Hawaii Company, and the High Tech Development Corporation

SONY

Location:
Coral 1 / 2

Introduction:
TED LIU, Director, Department of Business, Economic Development and Tourism, State of Hawaii, *USA*

Visitor Industry Presentation:
AKIO YAMAKITA, Executive Vice President and YUJIRO KUWABARA, General Manager, JTB America

Technology Presentation on FeliCa
TETSUJI OSAMURA, General Manager, FeliCa Business Center, Sony Corporation, *Japan*

Technology Presentation on CLIE GPS
HISATSUGU NAKAMUTA, General Manager, Network Business Center, Sony Marketing Japan, Inc., *Japan* and YUSUKE TANIO, Starr Seigle Communications, *USA*

Visitor Industry Panel:

Moderator:
MARK HUKILL, Interim Associate Dean, School of Travel Industry Management, University of Hawaii, *USA*

PTC'04

New Times—New Strategies: ICT Rising from the Ashes

Panelists:
JAY FIDELL, Attorney, Bendet, Fidell, Sakai & Lee; Advisor — Think Tech Hawaii, *USA*

RICHARD PETERSON, Vice-President, Electronic Commerce, Hawaiian Airlines, *USA*

PETER SCHALL, Executive Vice President, Hilton Hotels, *USA*

KATSUI TANAKA, President, ENOA Tours, *USA*

1500–1530
Afternoon Break

1530–1700
Super Sessions

SS1

Satellite CEO Round Table 2004: The Way Forward

Location:
Honolulu 1 / 2 / 3

Organized by the Satellite Industry Association (SIA) and PBI Media, LLC

The global communications satellite industry continues to target the Asia-Pacific region as an area in which it can reach out into new markets with traditional satcom services and new offerings. As the telecom sector continues to shake out, satellite concerns have positioned themselves for sustained profitability and steady revenues.

What are the key challenges facing satellite companies in the Asia-Pacific region? What techniques are these CEOs using to overcome those challenges? What's the new key market? Will there be more consolidation in this sector? The top CEOs from the global communications satellite industry will gather at PTC'04 to discuss how this dynamic sector of the communications market is surviving consolidation and facing increased competition and demand challenges. Executives from the top eight satellite companies involved in doing business in the Asia-Pacific region will participate in this conference Super Session.

PTC'04 Papers and Program

(Subject to Change)

Chairmen:

RICHARD DALBELLO, President, Satellite Industry Association (SIA), *USA*

DAVID BROSS, Associate Publisher, Editorial, PBI Media, LLC, *USA*

Panelists:

ZHAO BIN CHEN, President, APT Satellite Holding Limited, *Hong Kong SAR, China*

MARK DANKBERG, CEO, ViaSat Inc., *USA*

C. PATRICK DEWITT, President and Chief Operating Officer, Space Systems/Loral, *USA*

PETER JACKSON, CEO, Asia Satellite Telecommunications Co. Ltd., *Hong Kong SAR, China*

DUMRONG KASEMSET, Executive Chairman, Shin Satellite PLC, *Thailand*

CONNY KULLMAN, CEO, Intelsat Ltd., *USA*

DEAN OLMSTEAD, President and CEO, SES Americom, *USA*

SS2

The Undersea Communication Industry— The Rise of a New Down—Funding and Managing International Infrastructure

Location:
South Pacific 3 / 4

Organized by the SubOptic Executive Committee

The discussion and debate will be focused on the future of the industry and how the traffic forecasts will lead to a new impetuous in construction or an explosion in system upgrades. The panel will take questions from the floor on any related topics ranging from rationalization and restructuring of networks, operating cost structures, competitive supply, future growth prospects, sweating the assets etc.

Moderator and Chairman:
ALAN ROBINSON—C&W and SubOptic President, *UK*

Panelists:

DAVID BECK, Associate Director, Macquarie Infrastructure & Specialised Funds Division, *Australia*

WILLIAM MARRA, CTO and Vice President R&D and Network Planning & Engineering Tyco Telecommunications, *USA*

ED MCCORMACK, COO Flag Telecom, *UK*

BRIAN ROUSELL, President & CEO, WCI Group Inc, *USA*

ROBIN RUSSELL, CEO Australia Japan Cable (Management) Ltd, *Bermuda*

Rapporteur:
STEVE MCCLELLAND — Editorial Director Telecommunications International, *UK*

PTC'04 Papers and Program

PTC'04

Wednesday
14 January 2004

0715-0800
Speakers' Breakfast

Location:
Bali Restaurant

0830-1000
Concurrent Track Sessions V

W.1.1
Creating Competitive Advantage in the
New Environment

Location:
South Pacific 1

Chair:
ROGER T. NAFF, Director-Market Development, Boeing
Homeland Security and Services, *USA*

W.1.1.1
**Marketing and Regulation — An International
Users' Perspective on Contemporary
Marketing and Regulatory Issues Including
Attitudes to Competition, Constructive and
Destructive Uses of Bundling, Competition
Issues in Mobile, and the Outlook for Industry
Regulation**
ERNIE NEWMAN, Chairman, International
Telecommunications Users Group (INTUG) and Chief
Executive, Telecommunications Users Association of
New Zealand (TUANZ), *New Zealand*

W.1.1.2
The Value of Branding in Telecom Today
DAVID ROBLES, Senior Manager, EMEA Region and
ANDREW KOWALIK, Director — Marketing and
Strategic Planning, Tyco Telecommunications, *USA*

W.1.1.3
**The Way to Reflate Voice Revenues in
Telephone Network — A Case Study on the
KT's New Pricing Model**
MYENG JA YANG, Researcher, KT, *Republic of Korea*
and MMPhD Candidate, Michigan State University,
USA and WAN MOOK HWANG, Director, KT, *Republic
of Korea*

W.1.1.4
**The Triple Play Means It's Time for
Incumbents to Get Serious About Wholesale**
JEREMY GODFREY, Member of PA's Management
Group and VIRAT PATEL, Managing Consultant, PA
Consulting Group, *Hong Kong SAR, China* and ALAN
GRAHAM, Managing Consultant, PA Consulting
Group, *USA*

W.1.2
Fiber Optic Systems

Location:
South Pacific 2

Chair:
ANNE D. BOUTILLIER, Director, Asia-Pacific, T. Soja
& Associates, Inc., *Singapore*

W.1.2.1
**The Changing Economics of Regional
Submarine Networks**
JAN STRINGER, Product Manager, Short Haul
Systems, Global Marine Systems Limited, *UK*

W.1.2.2
An Evolutionary Fiber-to-the-Home Network
JIM FARMER, CTO and STEPHEN THOMAS, Chief
Architect, Wave7 Optics, Inc., *USA*

W.1.2.3
**Buying and Selling Submarine Cables:
The US Regulatory Landscape**
MARTIN L. STERN, Partner, Preston Gates Ellis &
Rouvelas Meeds, LLP, *USA*

W.1.3
Education

Location:
South Pacific 3

Chair:
W.A. SAM SHAW, President, Northern Alberta Institute
of Technology, *Canada*

W.1.3.1
Workforce Connections Knowledge Exchange
WILLIAM S. PERATINO, U.S. Department of Labor;
COURTNEY COX, PowerTrain, Inc.; and G.A. RED-
DING, Institute for Defense Analyses, *USA*

W.1.3.2
**E-Japan's E-learning Empirical Test — What
is an Effective Policy on E-learning?**
MAKOTO YOSHINO, President and CEO, BSI Co., Ltd,
Japan

W.1.3.3
**Bandwidth Connectivity — Innovative
Solutions for the Education and Training
Sectors**
PETER FARR, Chairman, Peter Farr Consultants
Australasia Pty Ltd., *Australia*

W.1.3.4
**Worldspace — Hewlett Packard Solutions for
e-Health, e-Government and Education**
ROXANA DUNNETTE, Technology Journalist, UIPRE
and Global Executive Senior Advisor, WorldSpace
Corporation, *Switzerland*

W.1.4
Pacific Islands

Location:
South Pacific 4

Organized by the Pacific Islands
Telecommunications Association (PITA).

Chair:
MAUI SANFORD, Acting President of PITA and
Manager, International Relations of OPT, *French
Polynesia*

The development of Pacific Islands Countries has
long been hampered by factors relating to dispersed
populations, small sizes and vast ocean distances.
These circumstances impose large costs on educa-
tion, health, social welfare, travel and communica-
tion and have limited the growth of important indus-
tries necessary for the economic development of
these countries. Bridging the digital divide is now
seen as "the" crucial factor in creating opportunities
to overcome these circumstances. The Pacific
Islands session will focus on the key issues prevail-
ing in the Pacific region relating to the digital divide
and aspects in bridging this divide.

Speakers:

**Can You Fix It? Why Social Context is
Important in Understanding the Digital
Divide for Technicians in the Pacific Islands.**
WILLIAM TIBBEN, Lecturer, School of Information
Technology and Computer Science, University of
Wollongong, *Australia*

**From Samoa TV to StAmP Net: Bridging
Pacific Partners Through Distance Learning**
JOHN H. SOUTHWORTH, Educational Associate,
Curriculum Research and Development Group,
College of Education, University of Hawaii, *USA*;
MARLENE HAPAI, Associate Dean, Academic and
Student Affairs, College of Tropical Agriculture and
Human Resources, University of Hawaii, *USA*;
CHRISTINA HIGA, Associate Director,
Telecommunications and Information Policy Group ,
Social Science Research Institute, University of
Hawaii and Director of PEACESAT, *USA*; BRUCE
BEST, Research Associate and Station Manager for
PEACESAT, University of Guam, *Guam*; SAL
POLOAI, Educational Technology IT Manager,
American Samoa Department of Education and Chief
Information Officer, American Samoa Community
College, *American Samoa*; and HAILI RIPLEY,
Teacher and Telecommunication Coordinator, Leone
High School, *American Samoa*

PTC'04 Papers and Program

(Subject to Change)

Bridging the Digital Divide: The Role of the
Commonwealth Telecommunications
Organisation (CTO)
EKWOW SPIO-GARBRAH, CEO, CTO, UK

1000-1030
Morning Break

1030-1200
Morning Plenary Session
Theme: Wireless Devices That Do
More

Location:
Tapa 1

Moderator:
To be advised

Speakers:
FENG PING YE, Executive Director and Vice
President, China Unicom Limited, Hong Kong
SAR, China

PAUL JACOBS, Executive Vice President
and President, Wireless & Internet Group,
QUALCOMM Incorporated, USA

1200-1400
Lunch (on own)

1200-1400
Lunch—Satellite Panel

Location:
Honolulu 1 / 2 / 3

**Military Communications Requirements in
the Pacific—The Private Sector's Role**
Nowhere is satellite communications more important
than in the broad expanse of the Pacific Ocean.
Global tensions have greatly increased the military's
communication needs throughout this region and
current military satellites are incapable of meeting
these new requirements. This distinguished panel of
military communication experts and civilian satellite
operators will discuss how commercial satellites and
teleports are supporting military requirements and the
unique challenges that this new partnership has
raised.

Hosted by:
Satellite Industry Association

1400-1530
Concurrent Track Sessions VI

W.2.1

The Wireless Access Debate

Location:
South Pacific 1

Chair:
PHILIP LOW, Managing Director, BroadGroup, UK

Wireless developments have continued to demon-
strate innovation in the migration towards a con-
verged network. Yet different approaches adopted in
provisioning urban wireless reflect the diversity in
technologies and solutions required. Wi-Fi has the
authority of the IEEE, and has been extensively
deployed worldwide already. Beyond this, recent
examples suggest the use of alternative technologies
will continue to drive developments. In this debate,
Wi-Fi will be assessed against a number of other new
wireless solutions to enable a valuable comparative
context. It will also provide delegates with the first
ever overview of markedly different approaches in
Asia.

Debators:
JUNGJOON KIM, Director, NESPOT Project Group,
Service Development Laboratory, KT Corporation,
Republic of Korea

REG COUTTS, Director of Technology Strategy, m.Net
Corporation, *Australia*

Session includes a special strategy paper:

**Business Analysis of Two Wireless Giants,
Vodafone and NTT DoCoMo: Strategic
Implications for SK Telecom to Strengthen its
Competitiveness**
SEONG-SOO JANG, Project Manager, Business
Strategy Division, Business Department and SUN-
KYONG LIM, SK Telecom; BUM-SOO KIM; JIN-WON
JEONG and YOON-CHUNG KIM, KTF; and CHANG-
HWAN AHN, IBM, *Republic of Korea*

W.2.2

**Key Issues for Successful
Implementation of Rural Tele-centers**

Location:
South Pacific 2

Chair:
KENJI SAGA, Chairman of the Digital Divide Study
Group, The Japan Society of Information and
Communication Research, *Japan*

In the year 2000, many international organizations
such as the UN, G8 Okinawa Summit and APT's Asia-
Pacific Summit on the Information Society, issued

declarations, IT Charter and Action Plans. All these
documents described how to bridge the Digital
Divide. Almost all national IT strategy documents in
the Asia-Pacific also identified the Digital Divide
issue as the most important policy to be solved.
Many rural tele-centers pilot projects are going on in
the Asia-Pacific region. Through our study, we identi-
fied some priority issues which remain unsolved. In
this session, we wish to provide selected key issues
for discussions among participants such as:

• How to realize sustainable operation for rural tele-
centers;

• How to solve last mile issue;

• How to implement cost-effective long distance access
lines for the Internet from rural and remote areas of
island nations in the Asia Pacific region.

Topics to be covered:
1) Analysis of policy recommendations by interna-
tional organizations on bridging the Digital Divide
in developing countries.

2) Analysis of report and policy recommendations by
academia and donor organizations on successful
implementation of Rural Tele-centers in developing
countries.

3) Results of our study: There are still many issues to
be solved.

Call for discussions: How to overcome existing
barriers?

W.2.2.1
**An Analysis of Policy Recommendation by
International Organizations**
TOMOKO NOGUCHI, PhD Candidate, Graduate
School of Interdisciplinary Information Studies, The
University of Tokyo, *Japan*

W.2.2.2
**ICT Strategies in Asian Countries and Japan's
Policy to Bridge the International Digital
Divide**
AYAKO TESHIMA, Researcher, Fujita Institute of
Future Management Research, *Japan*

W.2.2.3
**Barriers for Successful Implementation of
Tele-centers - Success Factors and Factors
Hindering Progress**
KENJI SAGA, Chairman of the Digital Divide Study
Group, The Japan Society of Info-Communications
Research, *Japan*

Discussants:
NASWIL IDRIS, The Indonesian Open Learning
University, *Indonesia*

BRUCE BEST, Research Associate, PEACESAT
TADEO, University of Guam, *Guam*

W.2.3
Higher Education: A Technology-Based Global Commodity?

Location:
South Pacific 3

Chair:
DAVID LASSNER, Chief Information Officer, University of Hawaii, *USA*

Speaking of new times and new strategies:
At PTC2003, at the opening plenary, the session audience asked Irwin Jacobs, co-founder and CEO of Qualcomm, to predict a major market for advanced wireless networks. His response: Education. Similarly John Chambers of Cisco has described Education as the "killer market" for networking in general. An educated and skilled workforce is widely recognized as one of the most important contributors to sustained economic and social development. At the same time, ICTs are enabling colleges and universities in many countries to move beyond their home turf, networking their products to students and partner institutions around the world. In many developing countries, education and government are pressing for advanced networks, recognizing their importance to an educated workforce. In this session, speakers from the IT industry and higher education will discuss the international needs and the significant international opportunities.

Speakers include:
GEORGE WARD, Founder, Cisco Networking Academy, Cisco Systems, *USA*

LOUIS FOX, Vice Provost for Educational Partnerships & Learning Technologies, University of Washington, *USA*

JOE MERTZ, JR., Associate Teaching Professor, School of Computer Science & Heinz School of Public Policy and Management, Carnegie Mellon University, *USA*

W.2.4
Country Studies and Comparisons

Location:
South Pacific 4

Chair:
MEHEROO JUSSAWALLA, Senior Fellow/Emeritus, East-West Center, *USA*

W.2.4.1
Electronic Commerce in Bangladesh: Status, Constraints and Prospects
PRADIP KUMAR PANDAY, Assistant Professor, Department of Mass Communication, University of Rajshahi, *Bangladesh*

W.2.4.2
ICT — A Distinct and Uniquely Caribbean Perspective
MIKE SINGH, Chairman and CEO, Telkom Caribe, *Caribbean*

W.2.4.3
Interconnect in China: A Framework for Development
DAVID OLDS, Lawyer, Arculli and Associates and Associate, Gu and Partners, *People's Republic of China* and PETER WATERS, Partner, Gilbert+Tobin and Associate, Arculli and Associates, *Hong Kong SAR, China*

W.2.4.4
Sri Lanka's Leap Across the Digital Divide
PATRICK Y. JULIEN, President, Caelis International, *Canada*

1530–1600
Afternoon Break

1600–1745
Closing Plenary Session & Closing Ceremony

Location:
Tapa 1

Closing Plenary Session Theme:
The World Summit on the Information Society — Building Partnerships for Implementation

Moderator:
RICHARD TAYLOR, Palmer Chair in Telecommunication Studies, The Pennsylvania State University, College of Communications, *USA*

Panelists:
BILL GRAHAM, Director for International Telecommunications Policy, Industry Canada, *Canada*

AHMED TOUMI, Director General & CEO, International Telecommunications Satellite Organization (ITSO), *USA*

WALDA ROSEMAN, President & CEO, CompassRose International, Inc., *USA*

MICHAEL CALVANO, Head, Regional Office of Asia and Pacific, ITU Asia Pacific, *Thailand*

PTC'04

Closing Ceremony

Convenor:
BRUCE DRAKE, PTC'04 Conference Chair, Pacific Telecommunications Council

Presentation:
PING LU, Director of the Information Industry Office, Tianjin Municipal People's Government, *People's Republic of China*

Closing Remarks:
2004 President and Chair, Board of Governors, Pacific Telecommunications Council

Thursday
15 January 2004

PTC Business Meetings

0800–0945
Membership Committee Meeting
Location:
South Pacific 2
Research Committee Meeting
Location:
South Pacific 3

1000–1200
Conference Committee Meeting
Location:
South Pacific 1

1300–1500
Advisory Council Meeting
Location:
South Pacific 3

1300–1730
Board of Governors Meeting
Location:
South Pacific 4
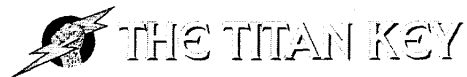
附件三：解決 Spam 問題

PTC '04

Solving the Spam Problem

THE TITAN KEY

Agenda

- Topics
  - Taxonomy: What's out there.
  - Evaluation: How do you pick the right one?
  - Best Practices: Do the right thing.
- Content Presentation
  - Executive Summary
  - Technical Details and demonstrations
  - In-line Q&A, discussion, and debate

www.titankey.com/ptc/

Stats on Spam: Email

- 31 billion daily emails sent
- 56 daily emails sent per email address
- 174 daily emails sent per person
- 34 daily emails sent per corporate user
- 10 daily emails received per person
- 3.1 average Email addresses per person

www.titankey.com/ptc/

Stats on Spam:

- 40% of all email considered spam
- 12.4 billion daily spam emails sent
- 2.5 billion daily porn emails sent
- 2,200 annual spam received per person
- $255 million spam costs to all non-corp Internet Users
- $8.9 billion spam costs to US corporations in 2002
- 26 states with anti-spam Laws
- 16% email address changes due to spam
- 63% estimated spam increase by 2007
- 2.1 million annual spam in 1,000 employee company
- 28% users who reply to spam email
- 8% users who purchased from spam email
- 15-20% corporate email that is considered spam
- 4.5 seconds wasted corporate time per spam email
www.titankey.com/ptc/

Spam Categories

Spiritual
4%

Other
3%

Leisure
6%

Products
25%

Internet
7%

Health
7%

Scams
9%

Financial
20%

Adult
19%
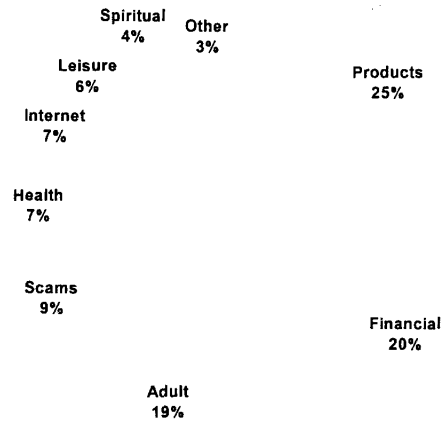
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What is spam?

- Unsolicited?
- Bulk?
- Forged?
- Inappropriate?
- No longer wanted?

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3

Spam is...

Unwanted email

Anti-spam Taxonomy

- Prevention
  - Stop the spread of spam
- Detection
  - How do we know it's spam?
- Response
  - What do we do with it?

Taxonomy: Prevention

- Whitelist – "Only those I trust"
- Blacklist – "I know you're bad"
- Challenge/Response – "Prove you're human"
- Consent tokens – "The royal seal"
- Notification only – "PO BOX for email"
- Deterrence – "We know who you are!"

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Taxonomy: Detection

- Human collaboration – "Mob Rules"
- Blacklists – "Post office wall"
- Reputation Systems - "UL Listed"
- Content Filtering – "It reads like spam"
- Forged Info – "I'm Spartacus"
- Delivery path – "How did you get here?"
- Quantity – "Billions and Billions"

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Taxonomy: Responses

- Accept
    - Quarantine
    - Challenge
    - Drop
    - Throttle
    - Label
    - Charge
    - Feedback
    - Prosecute

- Reject
    - Blacklisting
    - New Approaches

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Evaluation Framework

- Adoption Effort
- Impact
- Ongoing Usage effort
- Balance of burdens
- Efficiency

- Reliability
- Circumvention
- Personal post/Reply
- Mailing List
- Inter-Enterprise

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Server Best Practices

- Restrict unauthorized Mail Relay
- Mail path must be traceable
- Sufficient logging
- Able to refuse connections from host, IP, domain, sender
- Verify mail-from domain
- Control rate of email

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End-user best practices

- Use several email addresses or "DEA" D)isposable E)mail A)ddress
- Avoid publishing email address wherever possible and if uncertain, use a DEA.
- Turn off email graphics if possible.
- Use DEAs when registering for anything online.
- Don't follow remove instructions on spam.

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The Ultimate Anti-Spam Technology Checklist

- Prohibit transmission of spam altogether
- No spam folders
- Server, domain, and user level controls
- End-user is in control
- End-user can easily create DEAs
- End-user decides who can/can't use their email
- Compatible with any email client and server
- Sender is notified of spam action taken
- Zero collateral damage
- Uses combination of anti-spam approaches
- Minimal effort required and operates passively
- Scalable – Can work with the largest ISPs

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Legislation

- Europe: Opt-in
- U.S.: Opt-out
  - No forgery
  - Respect Opt-out
  - Include opt-out link
  - Include postal address
- Australia: Spam is illegal (clarity?)

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End of Executive Summary

Taxonomy: Prevention

- Whitelist – "Only those I trust"
- Blacklist – "I know you're bad"
- Challenge/Response – "Prove you're human"
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- Notification only – "PO BOX for email"
- Deterrence – "We know who you are!"

Whitelisting: what is it?

- Basic
  - Manually add senders to whitelist
  - Automatically add via analysis or implied action (e.g. Titan Key sending an email implies whitelisting)
- Verified
  - Authenticated – e.g. S/Mime
  - Token – e.g. Yahoo's "Mail keys"
  - Disposable email - e.g. Titan Key's "KeyMail"

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Whitelist Pro/Con

- Pro
  - Good way to make sure wanted email comes through
  - Effective way to bypass other filters
- Con
  - Cannot be the only solution
  - Auth/token schemes require widespread use/acceptance
  - Manual method implies labor cost

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Whitelist Demonstration

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Whitelist Suggested Use:

■Use it in conjunction with others
■Don't make this the only method

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Blacklisting: what is it?

- Block transmission via hostname, IP network, domain, or sender
- Manual maintenance
- Subscription
  - MAPS RBLS
  - Spamhaus

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Blacklist Pro/Con

- Pro
  - Effectively prohibits a connection, saves bandwidth and CPU resources
  - Affects server-wide users
  - Can be implemented immediately
- Con
  - Effectively prohibits a connection
  - Affects server-wide users
  - Some subscription services are highly controversial
  - Manual method implies labor cost

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Blacklist
Demonstration

www.titankey.com/ptc/

Blacklisting
Suggested Use:

■Use it in conjunction with others
■Don't make this the only method

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Challenge/Response

- Non-whitelisted senders must perform an action to get whitelisted
- Actions include:
  - Reply to email
  - Answer a question
  - Turing test: prove you're human

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Challenge Response Pro/Con

- Pro
  - Extremely effective in stopping spam
  - Relatively easy to implement
  - Does not require significant CPU resources
- Con
  - Extremely effective in stopping email like newsletters, auto responses, notifications
  - All C/R systems still have a spam folder that users need to review constantly
  - Immature systems send out unnecessary challenges and may not interoperate with others

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Challenge/Response Suggested Use:

- Use it in conjunction with others
- Don't make this the only method

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Challenge/Response Demonstration

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Prevention: Others

- Consent tokens – "The royal seal"
  - Hashcash
- Notification only – "PO BOX for email"
  - IM2000
- Deterrence – "We know who you are!"
  - Authentication, Tracking, etc
- Yahoo's "Domain Keys"
  - Public key in DNS record decrypts a private key in mail header

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Others Pro/Con

- Pro
  - Tokens, deterrence: Might work
  - Notification: Might save bandwidth
  - Yahoo: verifies a domain
- Con
  - Tokens, deterrence, Yahoo: Require widespread use
  - Notification: won't stop spam
  - Yahoo: what's in it for them?
  - Unproven

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Others
Suggested Use:

■Wait and see

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Taxonomy: Detection

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- Quantity – "Billions and Billions"

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Human Collaboration
"Mob Rules"

- A group of people vote on what is spam
- Complex computation makes public determination of spam
- Spam is quarantined
- Examples: Razor/Cloudmark, Brightmail, Spam Inspector

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Pro/Con: Human Collaboration

- Pro
  - Does a good job at identifying "mass" spam
- Con
  - By definition, implies huge hidden labor cost (100k humans!)
  - Only quarantines email. Users still have to review/delete
  - Does not reduce spam bandwidth or processing
  - No control for individual user. Only blocks what the mob rule considers spam

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Reputation Systems "UL Listed"

- Sender either volunteers or is recruited to system.
- Sender is assigned a reputation value based on various criteria
- Email from sender is blocked/allowed based on value of reputation
- Examples: Ironport, Cloudmark, Lumos

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Reputation Systems Pro/con

- Pro
  - Good way for legitimate bulk mailers to get through
- Con
  - Doesn't do a whole lot for spammers
  - Requires widespread use
  - Individuals don't determine spam
  - Users still review a quarantine folder
  - Does not solve bandwidth problem

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Reputation Systems Suggested Use:

■Wait and see

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Content Filtering
"It reads like spam"

- Most crowded space
- Too many approaches to evaluate and list
- Bayesian filtering is quickly becoming the most popular/powerful method
  - End user determines what is spam/not
  - Statistical filters determine subsequent email

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Content Filtering Pro/Con

- Pro
  - Can be user-profile based
  - Filters a good percentage of spam
  - Easily obtainable
- Con
  - Universally has either false positives or low spam detection
  - Legitimate sender of FP email never knows
  - User-based systems require "training" or manual work
  - Spam folder must be reviewed
  - Does nothing to reduce bandwidth

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Content Filtering Suggested Use:

- If you're mad as hell
- Just got to do something

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Forged Info – "I'm Spartacus"

- Sender's email address is "forged" to be someone else's, e.g. support@ebay.com
- Detection via various methods:
  - Domain lookup – verify domain
  - Verify address on calling server
- New standards emerging
  - Yahoo's domain keys
  - RMX – "Reverse MX"

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Pro/Con: Forged Info

- Pro
  - Relatively easy to implement
  - No change to SMTP Protocols
  - Typically stops transmission of spam
- Con
  - Easy for spammers to avoid
  - Will cause problems for some acceptable forgeries (Quickbooks, MSN IM)

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Forged Info Suggested Use:

- Use it in conjunction with others
- Don't make this the only method

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Taxonomy: Responses

- Accept
  - Quarantine
  - Challenge
  - Drop
  - Throttle
  - Label
  - Charge
  - Feedback
  - Prosecute
- Reject
  - Blacklisting
  - New Approaches

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Evaluation Framework

- Adoption Effort
- Impact
- Ongoing Usage effort
- Balance of burdens
- Efficiency

- Reliability
- Circumvention
- Personal post/Reply
- Mailing List
- Inter-Enterprise

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Adoption Effort

- What is the effort for a new participant to start using the proposed mechanism?
  - Installation
  - Learning curve
  - Initial operations

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Impact
How does it affect:

- Users of the technology
  - Receivers
  - Senders
- Non-users
  - Legitimate users?
  - Spammers?

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Ongoing Effort

- How much effort does it take to use it regularly?
  - False positives/negatives
  - "Marking" spam
  - Reviewing quarantine
- How does it affect regular email use in an ongoing basis?
  - Incorrect blacklisting
  - False positives
  - Unnecessary challenges

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Balance of Burdens

- Who has to work harder to use the technology, sender or receiver?
  - Sender: blacklisting, C/R, consent tokens
  - Receiver: Content filtering, any quarantine folder technology

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Efficiency

- Is Internet mail delivered in a timely fashion?
- Is the burden on processing and storage acceptable?
- High storage: Quarantine
- High processing: Filtering / Collab / Token
- Low storage: Blacklisting
- Low processing: C/R

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Reliability

- Is legitimate email more or less likely to be delivered? (trick question)
- What is the degree of impact on legitimate email?
- Define legitimate email first.

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Circumvention

- How difficult will it be for spammers to change their mail to bypass the proposed scheme?
- How are circumvention efforts likely to affect non-spam mail?
- Can Bayesian filters get out-bayed?
- Can extensive whitelists get forged?

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Real-World Scenarios
How well will it work for...

- Personal Post/Reply.
  - Initial contact. Regular contact
- Mailing List
  - Subscription. Ongoing discussions.
  - Recipient reply still work properly?
- Inter-Enterprise / Cross-group teams
  - Effort required to establish, support, maintain?
  - How are team changes handled?

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Evaluation Framework
Summary

■ Adoption Effort	■ Reliability
■ Impact	■ Circumvention
■ Ongoing Usage effort	■ Personal post/Reply
■ Balance of burdens	■ Mailing List
■ Efficiency	■ Inter-Enterprise

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Server Best Practices

- Restrict unauthorized Mail Relay
- Mail path must be traceable
- Sufficient logging
- Able to refuse connections from host, IP, domain, sender
- Verify mail-from domain
- Control rate of email

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Restrict Mail Relaying
Only accept email that:

- Is destined for a domain the server knows about, e.g. "internal" or "ours"

OR

- Sender's IP address is from acceptable source, e.g. "internal".

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Traceable Mail Path

■ Server must prepend traceable information, with at least IP address and time.

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Can you trace the path?

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```
Microsoft Mail Internet Headers Version 2.0
Received: from imail.centuryc.net ([216.30.168.20]) by io.cybercom.local with
Microsoft SMTPSVC(5.0.2195.6713);
          Wed, 31 Dec 2003 02:29:53 -1000
Received: from SMTP32-FWD by titankey.com
  (SMTP32) id A066C987D; Wed, 31 Dec 2003 02:31:21 -1000
Received: from cybercominc.com [66.91.134.126] by imail.centuryc.net
  (SMTPD32-8.03) id A1982FA010E; Wed, 31 Dec 2003 02:31:20 -1000
Received: from r0.zabco.net (207.176.130.70)
          by cybercominc-zzt with SMTP; Wed, 31 Dec 2003 12:42:25 GMT
X-Titankey-From:<rupankar@programmers.com>
X-Titankey-TO:<peter@titankey.com>
X-Titankey-e_id:<d363c2d0-b9ed-47bc-9eb5-8c8aab2479c5>
X-Titankey-Proxy_Match:<None>
X-Titankey-Email_Match:<Domain Level - Domain Match>
X-Titankey-Reason:<Not Supported Domain->Internal Domain->Domain Level
FRIEND>
Received: from programmers.com ([203.200.164.189])
          (authenticated (0 bits))
          by r0.zabco.net (8.11.6/8.11.3) with ESMTP id hBVCTLS25586
          for <peter@titankey.com>; Wed, 31 Dec 2003 05:29:21 -0700 (MST)
          (envelope-from rupankar@programmers.com)
Received: from rupankar ([192.168.0.95])
          by idc.programmers.com ([192.168.0.254])
          with SMTP (MDaemon.PRO.v6.7.8.R)
          for <peter@titankey.com>; Wed, 31 Dec 2003 18:03:24 +0530
Message-ID: <002701c3cf9a$48340db0$5f00a8c0@programmers.com>
```

Logging

- Be able to trace the event
- Anti-spam actions need to log:
  - Time
  - Refusal info: why?
  - RCPT-TO
  - IP & FQDN

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Refusing Connections

■ Server needs to be able to block a connection according to various criteria.
  ■ accept host.domain.example
  ■ refuse *.domain.example
  ■ accept 10.11.12.13
  ■ accept 192.168.1.0/24
  ■ refuse 10.0.0.0/8
  ■ refuse @junkemailers.com
  ■ refuse joe@joejobbers.com

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Treating MAIL FROM: <>

■ Special email address used for server-to-server communications of errors and special system messages
■ DO NOT BLOCK THIS

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Verify sender's domain

An email address from a domain that either does not exist or does not have a valid DNS record can and should be rejected

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Control rate of flow

- Mandatory
  - Limit # of connections
  - Limit # of errors
- Ideal
  - Auto-blacklist DHAs

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End-user best practices

- Use several email addresses or "DEA" D)isposable E)mail A)ddress
- Avoid publishing email address wherever possible and if uncertain, use a DEA.
- Turn off email graphics if possible.
- Use DEAs when registering for anything online.
- Don't follow remove instructions on spam.

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- No spam folders
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- Sender is notified of spam action taken
- Zero collateral damage
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Legislation

- Europe: Opt-in
- U.S.: Opt-out
  - No forgery
  - Respect Opt-out
  - Include opt-out link
  - Include postal address
- Australia: Spam is illegal (clarity?)

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Now What?

- Verify and follow best practices
- Understand and utilize evaluation framework
- Create your own customized evaluation framework
- Create your own Ultimate Checklist
- Compare and take action

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PTC '04

THE TITAN KEY

Solving the Spam Problem

附件四：VoIP 的第三波

The Third Wave of VoIP: Addressing the Needs of Incumbent Carriers

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Germany

(View Abstract)

1. Introduction

The telecom industry is on the verge of entering an exciting new wave of Voice over IP (VoIP) deployments. In its early years, VoIP technology was primarily utilized by alternative carriers in greenfield deployments in the international long distance and Internet offload space. However, improvements in technology and a strong set of business drivers have brought VoIP to the mainstream market. The rising worldwide demand for packet telephony solutions testifies to the fact that more and more carriers view VoIP technology as the best way to achieve their business goals in a highly competitive marketplace. Today incumbent carriers are deploying packetized solutions in the core of their networks.

As IP communications become ubiquitous and voice services eventually succumb to the pressures of IP economics, basic minutes transport and bandwidth provision are evolving into a commodity market. Moreover, with the maturation of packet voice technology, equipment providers are selling products such as IP-PBXs directly to the enterprise, in effect enabling these organizations to act as their own service providers. This relegates the carrier to the role of a bandwidth provider, which is far less lucrative than the traditional service provider role.

Since voice services will continue to be carriers' main revenue source for the foreseeable future, carriers must find new ways to preserve their margins. This challenge sets the stage for the third wave of VoIP – when the technology is adopted by incumbent carriers for national long distance and SIP-based enhanced services.

In this paper, we will analyze the factors leading up to this important transition, and present the myriad of opportunities that this third wave brings to forward-looking carriers and service providers.

2. History - First Wave

Packet telephony, also known as Voice over IP (VoIP), refers to the transmission of telephone conversations over a packet-switched IP network. Packet telephony allows

for a new range of services and capabilities based on a highly cost-effective, scalable and convergent infrastructure.

In traditional circuit-switched telephone networks, each call requires a dedicated circuit (line) that can carry voices from point A, say New York, to point B, such as Los Angeles. The transition about 20 years ago from analog to digital technology, called Time Division Multiplexing (TDM), made it possible to greatly increase the number of circuits within a single physical cable — hence increasing networks' capacity — but each circuit must still be dedicated to a single voice call.

Packet telephony was developed as an alternative to the closed, proprietary and expensive TDM-based circuit-switched networks operated by telecom carriers around the world. By harnessing the inherent efficiencies of IP networks, packet telephony can reduce carriers' operating costs by 20-30%.

The first generation of consumer Internet telephony products were largely based around the idea of integrating phone capabilities into computers, enabling "free" PC-to-PC voice communications over the Internet. The enormous public interest and high expectations for consumer VoIP software never materialized mainly due to quality issues. Nevertheless, VoIP's promise of reduced telecommunications infrastructure costs led equipment providers to develop VoIP products for carriers and service providers.

3. Second Wave – International Long Distance Services

As VoIP technology matured from a consumer niche product into a carrier-grade technology, it has steadily gained acceptance by carriers of international long distance (ILD) minutes. Probe Research reports that voice over packet ILD minutes grew approximately 68 percent to 18.5 billion minutes in 2002. Today, packet telephony networks generate approximately 12 percent of the world's international traffic and are operated by leading international carriers including Deutsche Telekom, Data Access, iBasis and ITXC. VoIP traffic is expected to account for 35 percent of the ILD market by 2005.

In the beginning of the second wave, mostly second-tier competitive carriers implemented VoIP in their core voice infrastructure. These carriers deployed VoIP gateways to digitize and transport voice as packets, leveraging public (Internet) or managed IP networks rather than traditional Class 4 switches for cheaper long-distance transmission. Most of these carriers operated in the international long distance market. In addition to these competitive carriers, the second wave also included a number of prescient incumbent ILD carriers, such as Deutsche Telekom, AT&T, China Telecom, and SingTel, which for the most part deployed VoIP networks in parallel to their legacy TDM networks.

Early adopters of VoIP technology (mainly competitive carriers) capitalized on the international arbitrage opportunity and were able to capture significant market share by offering low rates. However, as competitive market forces pushed the incumbents'

prices down, the arbitrage opportunity basically disappeared for these carriers. Today, as IP moves toward the edge, carriers are offering different types of services, particularly enterprise-focused applications and prepaid calling. VoIP deployments in newly deregulated, developing economies such as India, China and Nigeria have been very successful. In India, for example, Data Access was able to capture over 30 percent of the Indian ILD market within six months of service launch, using a VoIP backbone infrastructure.

Interesting models are emerging from these efforts to bring telephony to underserved populations (e.g., in Africa). A good example is the use of cybercafes to provide long distance services for people without a phone of their own. As service providers from developing countries expand into more developed markets and build additional Points of Presence (POPs), hardware and software costs are not the only considerations. In VoIP networks, considerably fewer personnel are required to operate and manage each POP than would be required for a large TDM-based tandem switch. Moreover, most of the network management can be done from a central site where personnel costs may often be lower than in more developed countries.

3.1 Deregulation Spurs Growth in Emerging Economies

Since the telecom slowdown in 2001, carriers in traditional leading telecom markets, including the United States, Japan, and the rest of the large developed economies, either froze or severely reduced capex spending. In such an economic climate, new service offerings or network technologies must show immediate short-term capital savings in order to be even considered by carriers.

Interestingly enough, the situation in emerging economies, especially countries currently undergoing or preparing for expected telecom deregulation, was and is quite different. VoIP traffic in deregulating and recently deregulated countries, such as India, the large Eastern European, African and South American countries, and certainly China, continued to grow due to the low cost economics. Characterized by insufficient infrastructure build-out, low teledensity and high call tariffs, coupled with an unsatisfied appetite for telecom services, emerging economies present a huge opportunity for both telecom service providers and equipment vendors alike. Accordingly, it is estimated that in the next five years, the bulk of telecom industry revenue growth will occur in emerging countries. It is also expected that emerging countries will continue to have a higher adoption rate of new advanced telecom technologies, particularly packet voice and mobile infrastructure.

3.2 Eroding Margins

Around the world, long distance and international call volumes continue to increase, but revenues per minute are declining. According to the FCC, international calls from the U.S. to other countries have increased from 200 million in 1980 to 6.6 billion in 2000. However, the average cost of 51 cents per minute in 2000 represents a price decline of more than 60% since 1980. Increased international calling is not restricted to the U.S.

market. For example, in just two years the volume of international telephone traffic outbound from Italy grew 48% from 3.3 billion minutes in 1999 to 4.8 billion minutes in 2001 (Probe Research). Domestic long distance minutes are also growing as prices decline, while the move to less usage-sensitive structures, often flat rate, puts tremendous pressure on cutting costs. In addition, the huge growth and increasing affordability of mobile communications around the world has further eroded the profits of wireline carriers. In the face of these decreasing margins, VoIP is a very attractive solution as it reduces carriers' operational costs.

4. Third Wave – Penetrating the Incumbent Carriers

The telecommunications industry is currently poised to transition to the "third wave" of packet communications. From a business perspective, carriers will need to address numerous challenges in this wave, including increased competition, customer churn, aging equipment and decreasing profit margins. In order to succeed, carriers will need to differentiate themselves by offering innovative and attractive services, harness new technologies, and address larger markets. As described above, the second wave of VoIP focused on ILD services that were mainly deployed by alternative carriers. In this wave, packet telephony technology will be increasingly adopted by incumbent carriers for the much larger national long distance (NLD) market.

For purposes of comparison, the NLD market is 15 times greater in terms of minutes than the ILD market. According to Probe Research, in 2002, 72 billion minutes of NLD traffic were carried over VoIP networks around the world. This number is expected to grow to 125 billion minutes in 2003 (68% increase). By 2007, NLD volumes are expected to reach 925 billion total minutes of use.

Initial implementations in Asia as well as announcements by leading North American carriers indicate that the national long distance market is ripe for VoIP. The international long distance arena served as a proving ground for the technology, both in terms of its carrier-grade reliability, quality and scalability – all of which are critical for incumbent NLD carriers. These carriers are looking to add new revenue generating services supported by VoIP, such as voice VPN to the enterprise, as well as lowering their operating expenditures.

4.1 Evolution of the Softswitch Architecture

VoIP deployments in the national long distance market will be primarily based on deployments of "softswitches." According to analyst firm Instat/MDR, a softswitch refers to "software that controls media gateways, provides PSTN call control, routing and signaling and mediates between different protocols and networks. A softswitch also has the ability to deliver enhanced services via feature servers and media servers (typically using SIP)."

The industry definition of a softswitch has evolved from being a product category (i.e., call control) to being a term more broadly used to define a network architecture that is open and distributed, with a distinct separation of the transport (media), call control and application layers.

Network and Services Management and Provisioning

Service/Application Layer
Service creation and integration (e.g., VoIP VPN, IP Centrex, IP-PBX, Calling Card, Unified Messaging, Call Center, Conferencing, Routing, etc.), Accounting, CDR Generation

Call Control Layer
Control media gateways, call processing, signaling, call switching, alarm handling, trunk resource management

Media Transport Layer
(e.g., Media GWs, Access GWs, Network Access Servers (RAS GWs))
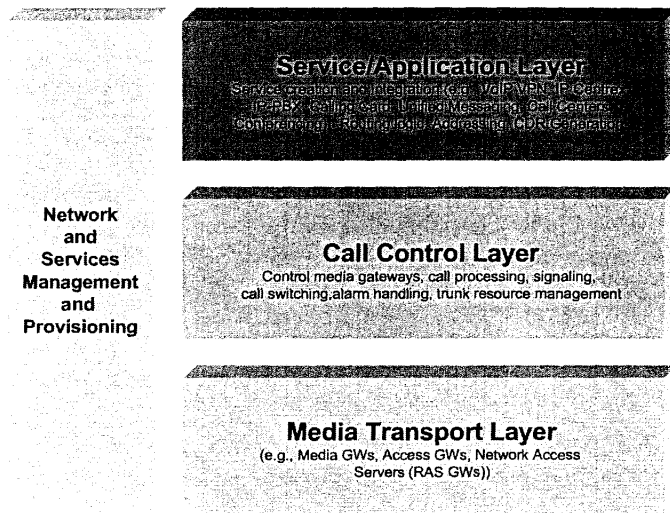
FIGURE 1. LAYERED SOFTSWITCH ARCHITECTURE

Initial softswitch deployments focused mainly on the Internet Offload application (i.e., diverting dial-up Internet traffic off the circuit-switched network to reduce the load on tandem switches). In 2002, more-established companies, including Telecom Italia, began to use softswitches for their long distance services. Momentum has picked up considerably in 2003, with a number of large North American long distance carriers having announced plans to convert their TDM-based long distance networks to IP.

4.2 Generating New Revenues via Enhanced Services

The commoditization of telecommunication services has forced carriers to differentiate themselves on factors well-beyond pricing alone. To compete for customers and drive additional traffic and associated revenues from their network investments, carriers are turning to advanced services, mainly for the burgeoning enterprise market. Carriers are looking to VoIP-based services deployable at the network edge as a way to provision new services rapidly and cost-effectively. Hosted VoIP services, such as IP-PBX, call centers, conferencing and VoIP VPN, give carriers a fresh source of much-needed revenues.

Advanced VoIP Service Revenue
World Market, Aggressive Forecast: 2001 to 2008
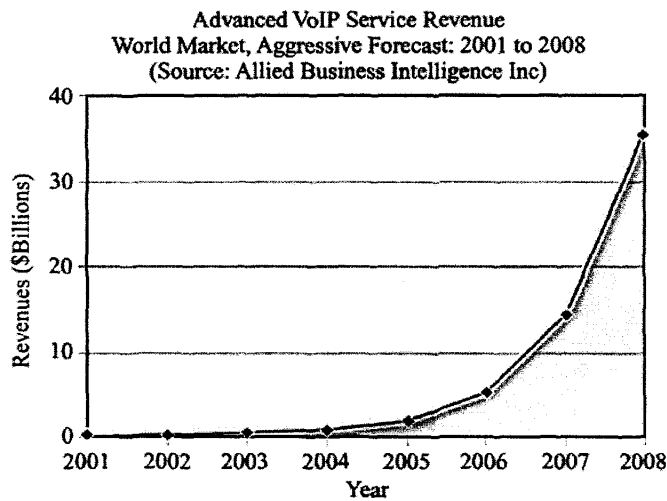**(Source: Allied Business Intelligence Inc)**

FIGURE 2. ADVANCED VOIP SERVICE REVENUE

As illustrated above, many analysts believe that the future of VoIP is in hosted or advanced applications, in which carriers offer to outsource VoIP for enterprise customers. Following are a few examples of hosted applications.

4.2.1 IP Centrex

IP Centrex, or hosted IP-PBX, is an IP-based version of the traditional circuit-based Centrex service, whereby a company's internal functions are hosted by the phone company. Centrex is widely seen as a way to outsource functions that otherwise would require an in-house PBX, supervised by internal staffers. On the downside, the approach forces businesses to rely on their carriers for new features and upgrades.

According to a report by Allied Business Intelligence Inc., hosted IP-PBX accounted for about $16 million in worldwide VoIP service revenues in 2001, roughly 35 percent of total sales. By 2008, hosted IP-PBX revenues are forecasted to grow to over $9 billion and will represent more than 25 percent of worldwide VoIP service revenues.

Another research firm, IDC, predicts similarly high growth for hosted IP Centrex (up to $6.7 billion by 2007). Emerging opportunities in IP Centrex will give carriers a practical and immediate means of moving into VoIP and a revenue-producing justification for deploying softswitch architectures, says a new report from IDC. These opportunities will drive IP Centrex revenue from $281 million in 2003 to $6.7 billion in 2007. Carriers must act quickly to enjoy the benefit of this market, as equipment vendors are also eyeing this market with enterprise-based solutions.

4.2.2 IP Call Center

Another area of promise in hosted applications is the IP call center, or network-based call center, which replaces the premise-based call center used by most customer service departments. IP call centers utilize an efficient and scalable all-IP architecture, allowing unified phone and web services and multi-tenant flexibility. This is an important new source of revenue for service providers, which can leverage their existing networks to provide call center services to enterprises.

IP call centers support "virtual" or distributed call centers — i.e., dispersing agents among many centers and routing calls among them as if they were co-located in one site. All call distribution and switching equipment is hosted and managed in a central site by a service provider that specializes in running call center equipment.

According to Ovum Research, network-based (IP) call center services are expected to grow exponentially, generating more than US$4 billion in annual revenues for telecom service providers by 2005. Ovum indicates that by 2005, 35% of call center agents worldwide will use some type of network-based call center service, with nearly half of those using network services as their primary call distribution method.

4.2.3 VoIP VPN

Virtual private networks (VPNs) are not new to the enterprise environment. Large corporations, as well as small and medium-sized enterprises (SMEs), have been operating IP-based VPNs for many years to carry large volumes of data traffic. VoIP VPN solutions, offered by several leading carriers, allow voice to be handled as another data application running over the corporate IP network. This allows enterprises to run all of their voice, data and fax communications over a single efficient network, managed and billed by one service provider.

Hosted VoIP VPN solutions represent a great opportunity to service providers, enabling the provision of private voice services to multiple enterprise customers over a shared infrastructure. This solution provides very fast ROI, while protecting the enterprise's investment in existing PBX equipment.

VoIP VPN basically provides multi-site enterprises with free inter-office ("on-net") calling as well as savings on off-net international calls. By aggregating voice traffic from multiple sites, the enterprise can enjoy volume discounts.

Carrier-provided Voice VPN solutions based on end-to-end VoIP connectivity circumvent the last mile and significantly reduce transport costs. These savings can be passed on to the enterprise, while still leaving the carrier with a better margin. Given the savings involved, it is no wonder that nascent VoIP VPN services in the United States are expected to grow to $1.4 billion by 2007 (Probe Research, April 2002).

4.3 Leveraging SIP in Next Generation Networks

To date, the telecommunications industry has witnessed the evolution of two main technology standards for packet voice – H.323 and SIP (Session Initiation Protocol). During the second wave, H.323 was widely deployed by carriers and still accounts for 90 percent of VoIP-based ILD traffic (Probe Research). While H.323 support remains a

key requirement for carriers needing interoperability for international, deregulating and emerging telecommunications markets, SIP has matured and solidified as a key enabler of IP voice applications.

SIP is being rapidly adopted as a universal protocol within next generation networks, enabling full interoperability with other mainstream IP protocols and driving the promise of converged services in next generation networks. The emergence of SIP is a critical factor as the industry moves into the third wave.

SIP is a signaling protocol used for establishing sessions in an IP network. A session could be a simple two-way telephone call or it could be a collaborative multi-media conference session. The ability to establish these sessions means that a host of innovative services become possible, such as voice-enriched e-commerce, web page click-to-dial, Instant Messaging, and IP Centrex services. SIP was designed to maximize interoperability so that it would be easy to bind SIP functions to existing protocols and applications, such as e-mail and Web browsers.

SIP is an RFC standard (RFC 3261) from the Internet Engineering Task Force (IETF), the body responsible for administering and developing the mechanisms that comprise the Internet. SIP is still evolving and being extended as technology matures and SIP products are deployed in the marketplace.

SIP delivers the following inherent benefits to carriers:

- Inherently distributed and flexible - enabling cost-effective scalability compared to the centralized PSTN model.
- Based on established protocols - ensuring vibrant, competitive set of offerings and interoperability of IP services.
- Interoperates with proven IP Protocols & TDM infrastructure - enabling delivery of carrier class services and high QoS.
- Leverages proven web development & deployment model - simplifying ability to deploy new services. Using SIP, telephony or multimedia capabilities become nothing more than another Web application that can be easily integrated with voice communications.
- Integrates seamlessly with existing security protocols - ensuring secure end-to-end sessions.

Softswitch architectures with SIP at the core enable carriers to enjoy the benefits of an open, distributed architecture and flexible creation of innovative SIP-based services. By incorporating a SIP-based service integration layer, service and routing logic and network complexity can be "hidden" from the call control layer responsible for PSTN/SS7 connectivity and interfaces to external networks/applications. By strictly adhering to open SIP standards and using SIP Servlets, carriers gain maximum flexibility in the creation and quick deployment of new enhanced services. No longer "locked" to a particular switch manufacturer, carriers may develop their own services using standard programming tools. Network management is simpler as services and

dialing plans are maintained in a centralized network-intelligent location. Such an approach will help carriers build highly effective next generation networks.

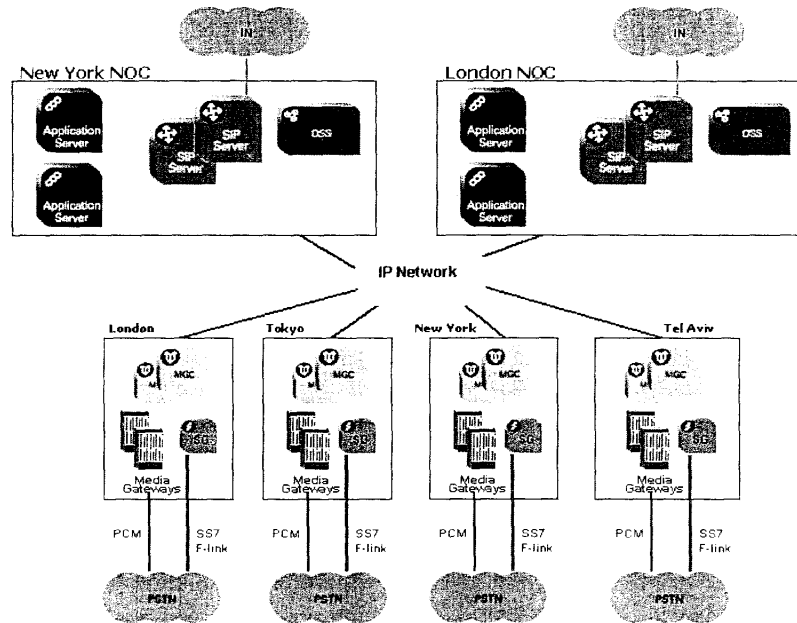The following diagram depicts such an architecture:

FIGURE 3. SOFTSWITCH ARCHITECTURE WITH SIP AT THE CORE

5. Conclusion

From its humble beginnings as a consumer Internet telephony product and H.323 network deployments for international long distance services, packet telephony has evolved to the latest SIP-based enhanced services controlled by softswitches.

The inevitable transition to an "all-IP" infrastructure for voice and data services presents numerous challenges to carriers and is forcing them to reassess the way they do business. We have shown that one of the keys for incumbent service providers seeking to generate new revenue streams in this transitional period is to refocus on the delivery of voice services to their customers, with an emphasis on the provision of enhanced SIP-based voice services. Some carriers are already moving in this direction with the deployment of softswitches to support advanced VoIP/SIP services. As this trend increases, as it must if service providers want to avoid commoditization of minutes-

based traffic, it will usher in a new wave of VoIP deployments in the huge national long distance market.