

出國報告（出國類別：開會）

2022 世界應急通訊大會出國報告

服務機關：內政部警政署警察通訊所

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派赴國家/地區：奧地利維也納

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摘要

世界應急通訊大會（Critical Communication World，簡稱 CCW），是關鍵任務（Mission Critical）通訊領域影響力最大的展覽會，本年度 CCW 於 2022 年 6 月 21 日至 23 日在奧地利維也納 Messe Wien Exhibition Congress Center 舉行，全球超過 18 個國家代表、130 位專家學者、70 家廠商、2,000 位業界人士出席參與及分享最新的關鍵通訊新知。2022 年的主題為「Evolving the Ecosystem 不斷演變的生態系統」，重點是生態系統需要如何發展，以跟上關鍵任務使用不斷變化的要求，相關議題包括寬頻通訊、標準化、基礎設施、網路安全、網路發展及投資需求與機會。

本所派員參加本年度世界應急通訊大會，除蒐羅應急通訊領域之專家、學者發表之最新技術，掌握通訊科技發展趨勢外，並了解各國現行公共安全單位通訊使用狀況，增進國際視野，相關內容與本所刻正辦理之「警用無線電汰換更新中程計畫」及「警消微波網路系統移頻計畫」息息相關，極有助於計畫推行及新計畫之推動。

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壹、目的

世界應急通訊大會是關鍵任務通訊領域影響力最大的展覽會，由來自世界各地的應急通訊專家學者、私人公司使用者、設備商、運營商及政府代表共襄盛舉，除了將整個行業生態系統聚集在一起，提供面對面交流的平臺，更替未來的應急通訊需求設定議程，為國際應急通訊標準提供一個討論空間。會議目標除為公共安全與救難應變單位提供相關應急通訊解決方案，致力於發表前瞻的應急通訊設備與應用方式，讓使用者能發現、比較當前尖端技術，獲得最新的政策與情報，並從真實案例研究與實踐中受益；更將未來目標設定於需求相似的工業應用整合，創造更大的市場機會，增加投資效益與降低專用通訊成本，提供可持續創新與演進之生態系統。

本所派員參加本年度世界應急通訊大會，除蒐羅應急通訊領域之專家、學者發表之最新技術，掌握通訊科技發展趨勢外，並了解各國現行公共安全單位通訊使用狀況，增進國際視野，相關內容與本所刻正辦理之「警用無線電汰換更新中程計畫」及「警消微波網路系統移頻計畫」息息相關，實有助於計畫推行及新計畫之推動。

貳、過程

一、會議內容

本年度世界應急通訊大會於 2022 年 6 月 21 日至 23 日在奧地利維也納 Messe Wien Exhibition Congress Center 舉行，會議內容概分展覽、一般發表會議、焦點論壇，相關議程及展覽時間如下：

一般發表會（免付費）舉辦時間	2021 年 6 月 21 日，11：00—17：15
	2021 年 6 月 22 日，09：45—17：30
	2021 年 6 月 23 日，09：30—14：00
焦點論壇時間	2022 年 6 月 21 日，13：00—17：30
	2022 年 6 月 22 日，12：30—17：30
	2022 年 6 月 23 日，12：30—14：00
展覽開放時間	2022 年 6 月 21 日，10：00—17：30
	2022 年 6 月 22 日，09：00—17：30
	2022 年 6 月 23 日，09：00—15：00

世界應急通訊大會發表的內容涉及公共安全及救難、一般政府單位使用、工業應用通訊等領域，包含關鍵任務通訊（Mission Critical Communications）目前所遭遇到的挑戰及各種解決方案，發表會的主講者有政府官員、企業領袖和專家學者等等，能從他們的經歷和研究中了解到最新尖端技術的發展應用；本次除了參與相關發表會，了解各項時事議題，也透過與現場參展廠商的互動，實際操作各項新型設備，了解最新市場與產品趨勢。

二、重要議題

2022 年世界應急通訊大會的主題為「Evolving the Ecosystem 不斷演變的生態系」，重點是生態系統需要如何發展，以跟上關鍵任務使用不斷變化的要求，相關重要議題包括寬頻通訊、標準化、網路安全、歐盟及各國應用現況，摘錄如下：

（一）寬頻通訊

越來越多的先遣應急人員（First responder）開始使用寬頻通訊及應用程式來增強既有的關鍵任務語音通訊及窄頻資料通訊，這也促使全球開始關注關鍵任務通訊應用的質量議題。

與消費者通訊系統不同，關鍵任務型通訊系統需要用戶到用戶之（End To End）間皆達到：「服務品質保證-QoS、優先級-Priority、搶佔-Pre-emption、可用性-Availability、安全性-Security、彈性-Resilience」，這也就意味著要成功佈署與管理是一項複雜的任務；從應用伺服器的機房環境安全、到傳輸、基地臺網路、再到設備及其相關操作系統，每一個皆需達到關鍵任務等級。

（二）標準化（5G及未來標準）

行動通訊往寬頻邁進已經進入10年了，2012年4G的一開始的開發主要是面向商用及消費者，所以後來不得不花很多時間在了解關鍵任務的通訊需求，相關要求非常嚴苛，甚至得從根本改變已建立的系統，這使的一切變的很困難。展望未來的5G，事情會大不相同，因為2023即將推出的3GPP Release 18（R18）大量的標準制定，是以滿足工業需求，而非只是消費者。

關鍵任務語音通訊本身並不困難，最困難的是直通模式，這完全違反了商業行動通訊系統的工作方式。而接下來的R18這將會是一個基本且更加擴展的應用，關鍵任務設備將充當閘道器，並將使3GPP及非3GPP產品皆可聯進關鍵任務網路，例如可支援WiFi平板電腦等。為了使寬頻通訊得以與既有無線電系統介接，相關的MCX(Mission Critical Service)、IWF解決方案(3GPP's InterWorking Function solution)等介面標準，也正在制定、驗證及測試。

公共安全的市場仍然很小，但是可以開始看到特定垂直行業與其他行業需求之間的共通性，這也是R18制定過程所展示出來的成果，很多工業用戶需要關鍵任務型通訊所需的必要功能，另外工業用戶也需要關鍵任務等級的系統彈性及可靠度。但現在並沒有完全真正可行的替代方案，現行的關鍵任務無線電的生命周期預計到2040年左右結束，到時這些系統用戶都會轉向寬頻通訊。

就3GPP而言，6G還在研究階段，但ETSI已經策劃了可能對6G很重要的候選技術，並與不同的機構研究及合作，例如從周圍環境蒐集能源的相關技術等。

（三）網路安全

隨著網路犯罪在公共和私人領域的不斷擴散，網路攻擊的數量、頻率和複雜程度不斷增加，雖然技術創新、遠程操作的增加和雲端應用的興起正在為全球組織帶來新的功能和能力，但也增加了潛在的網路攻擊面。

現今的關鍵任務通訊系統是整體的生態系統，也是一組複雜的IT相互依賴技術，極為需要能夠簡化管理並獲得對異構系統的可見性和控制性，同時提高運營效率。這就需要進行統一的安全管理生態系統—從網路到端點，從雲端應用到無線電，提供跨網路、設備、軟體和影像的統一安全管理和可見性的服務，確保關鍵任務的應變能力、彈性和可用性。

除了整體的安全管理生態系統，建議可透過風險評估、滲透測試及資安諮詢等作業進行系統評估，並於系統控管時藉由全年無休自動化的安全監控、即時補丁、備份還原及預先威脅調查等工作，搭配持續的人員教育訓練與學習，達到有效應對網路攻擊，保障系統安全維運。

（四）各國應用現況

1、 歐盟

BroadWay

由歐盟主持的BroadWay專案主要目標即是一促進歐盟國家之間公共安全寬頻通訊的相互驗證與漫遊功能。

BroadWay專案開始於10年以前，最終於去年2021年春季完成技術驗證階段，Frequentis與Airbus公司推出了三款原型設備，包含3GPP標準化的MC-PTT（Push To Talk,PTT）、MC-Video及MC-Data，並實際發送給技術評估組織進行測試；測試橫跨整個歐洲大陸，在預先地場景進行，由不同用戶於特定時間撥打電話，並且可以用原型設備進行PTT語音與視訊通話（但未包含關鍵任務群組通話），展望今年的技術驗證目標，除了證明通話外的各種關鍵功能，也必須可在沒有供應商隨時參與的情況下正常使用。

目前BroadWay，已來到第三階段，Airbus公司說明了於目前最重要的是解決國家之間的跨境通訊品質保證，其中最困難的是協調由各個國家內，各網路供應商提供的QPP（Quality-服務品質保證、Priority-優先級、Pre-emption-搶佔），因為通常當你漫遊到另一個國家時，將會失去所有的優先級設定，而這也是關鍵任務通訊最重要的。另外一個挑戰是於不同網路供應商間的網管中心，將用戶的參數設定鎖定，因為3GPP沒有定義這些項目，但同時，第二層的互操作性與關鍵任務通訊應用程序本身有關，例如MCX1與MCX2所需的介面來自3GPP的定義及Broadway的第一、第二、第三階段的測試與結果進行定義。

理想的情況是看到歐洲的每個商用網路都可以提供Priority及Pre-emption，歐盟司法部跟內政部現在也都支持這一概念，然而BroadWay專案即將於9月結束，取而代之的是本年度3月即開始的Broadnet Preparation專案，該項專案費用屬歐盟內部安全基金一部分，將持續驗證技術解決方案與系統互聯方式，預計至少持續18個月。

Broadway專案人員也坦承在沒有專用頻譜與單一運營商下，要成為像美國FirstNet一樣，有其困難，然而歐盟還是需要一個具互操作性的關鍵任務寬頻通訊解決方案，歐盟正在研究一個類似的模式，以一個單一組織來管理運營，雖然極其複雜，但隨著技術的進展，一切將更順利。

2、 英國

BWV

英國已宣布計畫為其高速公路上的交通執法人員配備統一的隨身攝影機（Body-Worn Video cameras,BWV），旨在承受所有嚴苛環境下的使用及所有天氣和光照下皆能捕捉高畫質的影像與音頻，並包含了證據管理軟體，可將影片上傳雲端並進行管理。

ESN

Emergency Service Network是由英國內政部領導的一項跨政府計畫，目標是透過新一代寬頻應急通訊系統，提供現代化的語音及數據平臺，並取代現行的Airwave（TETRA）無線電通訊系統。

ESN的目標使用者包括警察、消防、救護、等政府部門及公用事業服務，預計將有30萬名人員、45,000輛車、66臺直升機、100個以上的指揮控制室透過手持裝置及相關裝置進行連接。

ESN的快速機動技術可將緊急服務之間的通訊優先權高於所有其他網路使用者，就算在城市地區的使用尖峰時段，仍可確保第一線應急人員快速安全的進行通訊。

ESN的核心應用由Motorola Solution提供，而基礎網路是由EE進行建置，並藉由佈署更多4G基地臺，提供足夠的涵蓋，升級既有的網路，確保緊急服務優先於其他商業流量。ESN的基礎網路係由EE對既有19,000個站點進行升級及新建700個基站，並由內政部所規劃於偏遠地區建造292個基站所組成。

ESN的產品從一開始單純的SIM卡，到具有PTT的智慧型手機，再到後續的具有系統及指揮控制室操作功能，到最新可透過衛星鏈路臨時佈署基站增加涵蓋及應變特殊通訊需求。

ESN目前正利用EE移動網路服務與Motorola Solution的Kodiak MC-PTT產品相結合，並向英國部分地區的邊防部隊和移民局，在與Airwave並行的試驗基礎上，提供移動無線電語音和數據通信服務測試。



3、瑞士

在馬特洪峰山區，無線電設備商Motorola Solution將與瑞士電信營運商Swisscom合作，共同提供下一代符合3GPP標準的PTT解決方案，透過Motorola Solution的核心交換設備及Swisscom的寬頻網路作為緊急

通訊，並提供最高優先等級；首位用戶為瑞士最大的纜車公司，在進行山坡巡邏、雪地救援時，將使用新的PTT服務來進行通訊與資訊共享。

4、美國

FirstNet

美國為了統合全美公共安全網路，提供跨部門、跨區域之第一線應急人員使用，商務部於2012年成立獨立機構First Responder Network Authority（FirstNet管理局），規劃分配20 MHz的頻譜建立一個用於國家應急人員的寬頻網路FirstNet，並授權FirstNet管理局確保網路的建設、部署和運營。憑藉多年的公共安全諮詢和數據收集，FirstNet管理局於2016年1月發布了RFP，後於2017年3月向AT&T授予了一份為期25年的創新合約，並計畫於5年內提供65億美元的建設基金，AT&T則於25年內投入400億美元用於網路基礎設施的建設與維運，該頻譜所建置基礎設施雖可進行商業營運，但需確保網路的覆蓋率及優先提供緊急救難使用。

經過不斷與美國各地的地方、州、領地、部落和聯邦公共安全機構進行協商，FirstNet於2018年開始全國性的公共安全頻譜擴建，並於2019年達到100萬臺設備連接；FirstNet後續批准了7800萬美元和1.45億美元，用於2019年和2020年的網路投資，通過擴展網路的部署計劃和核心設備升級，達到啟用5G網路功能及建立整體生態系統來增強FirstNet，其中，並擴大了可機動部署的專用通訊車隊，確保FirstNet用戶在緊急情況和事件期間擁有所需的覆蓋範圍和傳輸容量。

通過持續的參與戰略，FirstNet管理局與全國各地的公共安全機構建立了有意義的合作夥伴關係，以提高對FirstNet的認識，並幫助獲得有關應急人員對該網路的需求的寶貴反饋，至今已佈署超過95%的涵蓋，超過2萬個政府單位及機關構、330萬使用者、195個應用程式、800臺機動通訊車進行與FirstNet連接。



5、 澳大利亞

澳大利亞正在進行相關數字化轉型計畫，藉由部屬各種觸發器來自動更改無線電編程，例如電子地理圍籬、失去集群模式之應變、藍芽信標、自動車速控制；最初的使用案例是以爆炸區域為中心設置電子地理圍籬，當有第一線同仁進入該區域時，會在他們和爆炸處理小組的無線電上發出警告，以進行現場人員管控。

三、 嚴重特殊傳染性肺炎疫情影響

因應嚴重特殊傳染性肺炎（COVID-19）於國際間傳播，中央流行疫情指揮中心於2022年6月11日修正公布邊境檢疫措施，為6月15日零時起（航班表定抵臺時間）採3天居家檢疫及接續4天自主防疫之方式辦理；另返臺登機時應持有表定航班時間前2日內之核酸檢驗報告，於機場入境時採集深喉唾液檢體進行核酸檢測，以確保國人健康安全。故本次出國人員於出國期間均隨時注意自身防疫措施及配戴口罩，避免染疫而於返國後危及他人。

然奧地利境內當時並無相關管制規定，故會場照片內所示之工作人員、他國專家與機關代表均未配戴口罩，惟出國人員仍謹慎防疫，於返國後並未有染疫情形發生，確實達成出國任務。

參、心得及建議

一、心得

本次有幸能到奧地利維也納參加 2022 世界應急通訊大會，除了蒐集應急通訊的新知，維也納的城市治安、環境、公共運輸讓人非常印象深刻，公共場所乾淨明亮、治安良好、交通便利、遇到的人也都很友善。在街頭剛好遇到當地警察在服務民眾協尋錢包，非常有耐心；身為相關從業人員，馬上觀察起來當地警察身上的裝備，確實是攜帶歐盟地區主要使用的 TETRA 無線電。維也納雖然是國際級的觀光城市，卻不會有吵雜髒亂的感覺，悠閒卻又井然有序，不愧為全球宜居城市的榜首。

本次世界應急通訊大會的主題為「Evolving the Ecosystem 不斷演變的生態系統」，會議內容涉及公共安全及救難、一般政府單位使用、工業應用通訊等領域，包含關鍵任務通訊目前所遭遇到的挑戰及各種解決方案、未來標準的制定等。整體會議包含展覽、一般發表會議、焦點論壇，本次除了參與相關發表會，了解各項時事議題，也透過與現場參展廠商的交流，實際操作各項新型設備，了解最新市場與產品趨勢。

為了因應現今社會上日趨複雜的治安狀況，以及民眾對於公共安全及救難單位的快速反應要求，未來的關鍵任務通訊系統除了需要符合第一線使用者穩定、即時、彈性的語音通訊需求，急需要影像及數據傳輸等新進功能，也因為科技技術的進步，現行整體的發展正走向整合各項複雜的異構系統，從網路到端點，從雲端應用到無線電，從前端邊緣計算到系統後臺數據管理，提供跨網路、設備、軟體和影像功能，使整個通訊系統成為一個生態系統，得以有效支援應急人員的各項需求。

藉由本次的會議可以了解到美國的 FirstNet 及英國的 ESN 寬頻應急通訊網路，在發展及應用上，屬於全球的先驅，在該國內的網路基礎設施、應用解決方案、終端設備的建置皆已經有相當的規模，也已經有相當的使用者進行連接，經了解該兩國皆採成立專門的組織及計畫、釋出專用頻譜與國內既有電信商合作，雙方一起投入一定規模的預算進行擴建及升級系統，以達到關鍵任務通訊所需要的涵蓋率及通訊品質保證。此作法除了承攬的電信商不用負擔巨額的頻譜費用，及獲得一定的資金補貼擴建整體系統涵蓋，也可以在系統升級，確保優先等級後，讓公共安全及救難單位人員可以直接使用電信商既有系統，達到雙贏的局面。

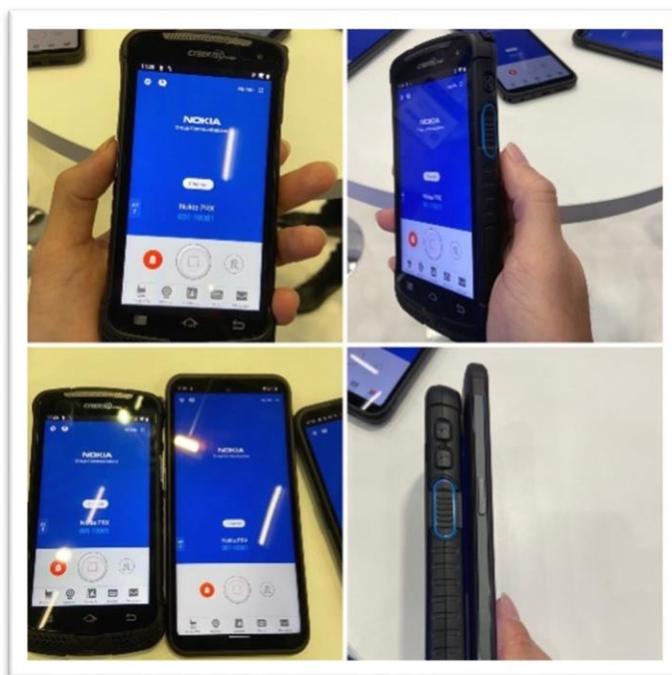
參考美國及英國的應急通訊系統建置，相關官員一再提到系統建置應有充分之溝通及資料蒐集前置作業，與第一線使用者溝通需求極為重要，也提到需求溝通最耗費時間，但才得以規劃出符合實際需求的系統，避免後續的浪費。

在與現場參展人員交流的過程及後續的資料收集中，也了解到先前美國及英國建立的寬頻應急通訊系統，主要採 OTT (Over The Top) 的架構，係透過行動通訊網路進行傳輸並搭配應用層的伺服器進行通話，雖然可以進行寬頻語音、影像及數據通訊，但除了延遲較高外，也難以與既有的 LMR 系統(Land Mobile Radio)

進行互操作，無法發揮既有 LMR 完整功能。爰相關的業者也正在測試及驗證，提供集成到運營商網路中的 Push To Talk over Cellular (PoC) 服務，以降低相關延遲，更進一步的，更緊密地嵌入到通訊網路的「核心集成設備」，也正在測試驗證當中，目標即是標準化相關介面及降低通訊延遲。

可以了解到美國、英國及歐盟先進國家，皆投入大量的經費、人力進行寬頻通訊的研發及建設，相關的計畫也是在邊建置邊研發當中進行，為了確保既有 LMR 通訊的不中斷，標準化的 IWF 解決方案是勢在必行，各國也正在努力使 5G 在 MC-PTT、MC-Video 和 MC-Data 等方面可以標準化。

除了網路及核心設備，會場內不少廠商展示了關鍵任務寬頻通訊所需的強固型手持式終端裝置，可以看到設備左側與右側皆有設置方便按壓之按鍵，可按壓左側按鍵進行即時群組通話 MC-PTT，按壓右側按鍵進行即時影像傳輸 MC-Video（或稱 Push To Video, PTV），並可自定義右邊按鍵進行相關 MC-Data，下圖可見一般智慧型手機與強固型手機之比較，整體較為厚實。



另外於展場內也可看到 LMR 結合智慧型手機之設備，經檢視該設備因需要整合 LMR 通訊模組及行動通訊模組，整體設備體積較大，也較厚實。



現場的官員也提到，他們目前並不會放棄既有的 LMR 系統，因為使用者的習慣，尚需要慢慢克服，另外 LMR 特有的直通通訊模式，也尚未標準化及產品量產化。

二、建議

- (一) 本所目前推行之「警用無線電汰換更新中程計畫」，除採購無線電設備外，得標廠商於未來亦將交付寬頻通訊解決方案設備，本所屆時將結合本次參與會議所得新知及各國應用經驗，進行驗證及測試，確保警察同仁得以儘快使用最新、穩定、快速之科技設備，並發揮採購設備之最大效益。
- (二) 寬頻通訊系統仍持續在發展及驗證測試，尚未能取代既有 LMR，建議可持續參加相關國際通訊會議，以取得科技發展之第一手消息，拓展本所國際視野，增加通訊人才儲備，並借鏡新進國家建置經驗，俾利既有計畫之推行及新計畫之推動。
- (三) 通訊科技日日益新，現今 5G 與低軌道衛星通訊蓬勃發展，新型設備與工具亦推陳出新，未來應會開發相關結合應用之器材或設備，故應持續掌握最新研發狀況與開發成果，期能與公共安全相結合，以精進警察勤務運作與改善通訊指揮效益，並提升社會治安及兼顧警察執勤安全。

肆、附錄

一、一般發表會議程



CRITICAL COMMUNICATIONS WORLD 2022

CONFERENCE TIMETABLE

21ST JUNE 2022

08:30-10:00
REGISTRATION

10:00-10:30
OPENING CEREMONY

10:30-11:00
EXHIBITION

THEATRE A TRANSITION TO BROADBAND AND 5G

11:00-11:30
TCCA WELCOME AND INTRODUCTION
MIADEN VRATONJIC, Board Chair & Director, TCCA
KEVIN GRAHAM, Chief Executive, TCCA
TERO PESONEN, Board Member and Director, TCCA

11:30-12:00
**KEYNOTE ADDRESS 1:
MISSION CRITICAL COMMUNICATION –
A EUROPEAN PERSPECTIVE**
GÜNTER GRAF, Vice President New
Business Development, Frequents AG

12:00-12:30
**KEYNOTE ADDRESS 2:
HARNESSING THE POTENTIAL OF
THE INTERNET OF THINGS (IOT) FOR
CRITICAL COMMUNICATIONS**
MARIE HOGAN, Head of Mobile
Broadband and IoT, Ericsson

12:45-13:15
**INTERNATIONAL COLLABORATION FOR
DRIVING CRITICAL COMMUNICATIONS
FORWARD**
TERO PESONEN, Board Member and
Director, TCCA & Chair, CCBG, TCCA

13:30-14:00
**SAUDI ARABIA ROADMAP FOR
SPECIALISED NETWORK RADIO LICENCE
IN THE 450 MHz BAND**
ENG. SAAD IBRAHIM ALASKAR, Director
of Field Operations, Communication
and Information Technology
Commission (CITC), Saudi Arabia
ENG. ABDULLAH BASHAR ALMUTARI,
Acting Director of Spectrum Planning and
National Cooperation, Communication
and Information Technology Commission
(CITC), Saudi Arabia

14:15-14:45
**SESSION SPONSORED BY ERICSSON
COMMUNICATIONS YOU CAN ALWAYS
RELY ON**
ANTONIO FERNANDEZ MERINO, Global
Head of Sales Public Safety, Ericsson

15:00-15:30
**MANAGING DEMAND AND CONTACT
ON SOCIAL MEDIA TO THE SAME
STANDARD AS TELEPHONY**
DAVID BAILEY, Social and Digital
Communications, Police Digital Service

15:45-16:30
**PANEL DISCUSSION: NETWORK
PLANNING FOR CRITICAL BROADBAND**
Chair: ILDEFONSO DE LA CRUZ
MORALES, Principal Analyst, Critical
Communications, Omdia
ANTHONY SUTTON, Chief Commercial
Officer, Rampion Wireless
TOM COOPER, Senior Sales Director,
Avani Wireless
FRANÇOIS GOUDENOVE, Sales Officer,
Syntony GNSS

THEATRE B TRANSITION TO BROADBAND AND 5G

12:30-13:00
**DEVELOPMENTS IN 3GPP
STANDARDISATION FOR MISSION
CRITICAL COMMUNICATIONS**
GEORG MAYER, Chair, 3GPP, SA

13:00-13:30
**EVERYTHING YOU NEED TO KNOW
ABOUT MCX COMPLIANCE ASSESSMENT**
FIDEL LIBERAL, Coordinator, MCS
Tasting & Professor, University of the
Basque Country

13:45-14:15
**INTERWORKING OF MISSION
CRITICAL BROADBAND AND CURRENT
NARROWBAND SYSTEMS**
HARALD LUDWIG, Chair, Technical
Forum, TCCA

14:30-15:30
**PANEL DISCUSSION: HOW TO GET
BROADBAND SERVICES UP AND
RUNNING: TESTING AND CERTIFICATION**
Chair: HARALD LUDWIG, Chair,
Technical Forum, TCCA
BRIAN HOBSON, Senior Director,
Roadmap Development Division, US
Government First Responder Network
Authority
DEBECK ORR, Division Chief, NIST Public
Safety Communications Research
Division

RENAUD MELLES, Head of International
Cooperation, Standardisation and
Innovation, RRF Programme, French
Ministry of Interior
KARI JUNTILA, Development Manager,
Eriilisverket
PETER CLEMONS, President, Quixoticity-
EU & Vice President, Standards,
EUWENA
STEVEN WYCKERT, Next Generation
Communications Product Owner -
Mobile Devices, ASTRID

15:45-16:15
**FREQUENTIS SPONSORED SESSION
HOW CAN TETRA AND MISSION
CRITICAL BROADBAND
COMMUNICATION INTERACT IN
FUTURE?**
CHARLOTTE RÖSENER, Head of Mission
Critical Services, Frequents AG
BENO BOUVENS, Chief Technology
Officer, Rohill BV

16:15-17:00
**PANEL DISCUSSION: HOW TO GET
BROADBAND SERVICES UP AND
RUNNING:
FUNDING OPPORTUNITIES**
Chair: PETER CLEMONS, President
Quixoticity & Vice-President, Standards,
EUWENA
SARAH HUGHES, Prize Challenge
Specialist, NIST Public Safety
Communications Research Division
DAVID LUND, Coordinator of Broadband/
GNSS, Public Safety Communications
Europe (PSC-E)
KIRSI KOKKO, Head, Digital Trust
Finland, Business Finland

THEATRE C LOOKING TO THE FUTURE

12:45-13:15
TETRA TODAY AND INTO THE FUTURE
FRANCESCO PASQUALI, Chair, TETRA
Industry Group, TCCA

13:30-14:00
**USING AI AND CROWDSOURCED
NETWORK INFORMATION TO IMPROVE
RELIABILITY OF THE CRITICAL NETWORK**
JARNO TASKINEN, Head of Marketing,
Menture Group

14:15-15:00
**PANEL DISCUSSION ON CLIMATE
CHANGE**
Chair: KATARINA SALMISALO,
Communications Director, Eriilisverket
JOHN WINTERBOURNE, Market
Development Manager, Ballard Europe
RICARDO GONZALEZ, MSSSI VP
International Core Strategy, Motorola
Solutions
JUERGEN TUSCH, Senior
Telecommunications Executive, Dr
Tusch Consulting

15:15-15:45
**SESSION SPONSORED BY CCF
BROADBAND FIELD OPERATION – FEEL
THE REAL FUTURE BY SIMULATION**
ELINA AVELA, CEO, Beaconsim

16:00-17:00
VISIONS OF 6G
Chair: PHILIP MASON, Editor, Critical
Communications Today
PAOLO BARRACCA, Research Engineer,
Nokia
HARRI SAARNISARRI, University
Researcher, University of Oulu
MIKA SKARP, Senior Project Manager,
Cumucore

THEATRE D LOOKING TO THE FUTURE

12:45-13:15
**INTRODUCTION TO ADVANCED AND
FUTURE TECHNOLOGIES**
ROBIN DAVIS, Chair, Future
Technologies Group, TCCA
IAIN IVORY, Co-Chair, Future
Technologies Group, TCCA

13:30-14:15
**PANEL DISCUSSION: HOW CAN WE
INCORPORATE FUTURE TECHNOLOGIES
INTO OUR OPERATIONS?**
Chair: ROBIN DAVIS, Chair, Future
Technologies Group, TCCA
ANTTI KALUPPINEN, Chief Technology
Officer, Eriilisverket
NINA MYREN, Deputy Head of
Department, Norwegian Directorate for
Civil Protection (DSB)
DAVID JACKSON, Director of Business
Engagement, Police Digital Service
CHRIS LUCAS, Senior User and
Assurance Manager, NHS Ambulance
Radio Programme

14:15-14:45
**AI BASED ADAPTIVE NETWORK FOR
SMART CITIES**
BHAGVAN KHOMMADI, CEO, Quantico,
Compuccoo

15:00-15:30
**INTELSAT SPONSORED SESSION
INTELSAT HIGH-THROUGHPUT
SATELLITE CONNECTIVITY FOR CRITICAL
COMMUNICATIONS**
JOEL SCHROEDER, Director, Land Mobile
Products, Intelsat

15:30-16:15
**PANEL DISCUSSION: HOW CAN PUBLIC
SAFETY BENEFIT FROM INTERNET OF
LIFE SAVING THINGS?**
CHAIR: BARBARA HELD, Journalist,
Behörden Spiegel
JÜRIG WETTERAU, Communication
Consultant, Laboratory for
Communication
SAMUEL GUSTAFSSON, Head of Sales,
Europe, Airbus
GILLIAN SMITH, Vice President
Marketing, NextNav

16:30-17:15
**PANEL DISCUSSION: SECURE CLOUD
BASED SOLUTIONS**
MIKA NIEMINEN, Product Manager,
Eriilisverket
MIKA MYLLYMÄKI, Solution Business
Manager, Airbus
DAVID BAILEY, Digital Engagement
Manager, Police Digital Service



CONFERENCE TIMETABLE

22ND JUNE 2022

THEATRE A INTERNATIONAL PERSPECTIVES AND COLLABORATION

09:45-10:00
WELCOME TO DAY TWO

10:00-10:30
KEYNOTE ADDRESS 1:
WHAT WILL THE FUTURE LOOK LIKE IN
10-20 YEARS, AND WHAT SHOULD WE
DO ABOUT IT NOW?
SPEAKER TO BE CONFIRMED

10:30-11:00
KEYNOTE ADDRESS 2:
HOW TO STANDARDISE 5G
ADRIAN SCRASE, CTO, 3GPP & TCCA

11:15-11:45
THE FUTURE MISSION OF PUBLIC
PROTECTION AND DISASTER RELIEF
COMMUNICATIONS
PAUL STEINBERG, Senior Vice President
of Technology, Motorola Solutions

12:00-12:30
ENHANCING MISSION-CRITICAL TETRA
INTO THE FUTURE
MADALIN-VICTORIA MIHAJ, Technical
Deputy Director, Special
Telecommunications Service, Romania

12:45-13:15
"WE ARE ONE ALREADY" – BENEFITS
AND CHALLENGES OF CROSS-
CONNECTED NETWORKS IN THE
NORDICS MOVING TO BROADBAND
JARMO VINKVIST, COO & Virve Operator,
Eriallisverket

13:30-14:00
SESSION SPONSORED BY HYTERA
CHRISTINE CANT, Head of Product
Management Europe, Hytera
Communications Europe

14:15-14:45
FOSTERING INNOVATION FOR MISSION
CRITICAL BROADBAND
THOMAS SCHOLLE, Head of Directorate
Strategy and Central Management,
BDBOS

14:45-15:15
PROJECT MEMO – A FACELIFT TO THE
LARGEST TETRA NETWORK WORLDWIDE
THOMAS BRANDT, Project Manager,
Network Modernisation & Head of Unit,
Federal Agency for Public Safety Digital
Radio (BDBOS)

15:30-17:30
GAGV: CRITICAL COMMUNICATIONS
UPDATES FROM AROUND THE WORLD
Chair: BARBARA HELD, Journalist,
Behörden Spiegel
Jo DEWAELE, Marketing Strategy Team
Leader, ASTRID, Belgium
DONGCHAN KIM, VP, Korea Safe-Net
Forum, Republic of Korea
CATE WALTON, Technical Lead,
Emergency Services Mobile
Communications Programme (ESMCP),
Home Office, UK
LISA CASIAS, Deputy CEO, US
Government First Responder Network
Authority, USA
ARI TOIVONEN, Programme Director,
Virve 2.0, Eriallisverket, Finland
RENAUD MELLIER, Head of International
Cooperation, Standardisation and
Innovation, RRF Programme, French
Ministry of Interior, France
VIKTOR KOHARI, Head of Service
Development, Pro-M, Hungary
PHIL CRANKO, Chair, Finance and
Governance Committee, PSBN
Innovation Alliance, Canada

THEATRE B TRANSITION TO BROADBAND AND 5G

11:00-11:45
PANEL DISCUSSION: HOW CAN WE
MOVE FROM 4G TO 5G OR 6G?
Chair: NINA MYREN, Head of
Section, Department for Public
Safety Communications, Norwegian
Directorate for Civil Protection (DSB)
KASHIF MAHMOOD, Director, Next
Generation Platform, Telenor
BRIAN HOBSON, Director, Roadmap
Development Division, US Government
First Responder Network Authority
JASON JOHUR, Strategy and Market
Development Director, Ericsson &
Vive-Chair, Broadband Industry Group,
TCCA
THOMAS REHBERG, Head of Public
Safety Market Segment, Nokia

12:00-13:00
PANEL DISCUSSION: HOW TO GET
BROADBAND SERVICES UP AND
RUNNING: WHAT ARE THE OBSTACLES
AND CHALLENGES?
Chair: ILDEFONSO DE LA CRUZ
MORALES, Principal Analyst, Critical
Communications Omdia
RICARDO GONZALEZ, MSSSI VP
International Core Strategy, Motorola
Solutions
THOMAS REHBERG, Head of Public
Safety Market Segment, Nokia
RONNY HARPE, Head of Rakel, Swedish
Civil Contingencies Agency, MSB
BRIAN HOBSON, Roadmap Development
Division, US Government First
Responder Network Authority
KARI JUNTILLA, Development Manager,
Suomen Eriallisverket Group

13:15-13:45
CCF SPONSORED SESSION: HOW
TO BUILD A TRUSTWORTHY 4G/5G
NETWORK
SPEAKER TO BE CONFIRMED, Eriallisverket

14:00-15:00
PANEL DISCUSSION: CRITICAL
COMMUNICATIONS FROM AN MNO
PERSPECTIVE
Chairs: JARMO VINKVIST, COO & Virve
Operator, Suomen Eriallisverket & BERIT
ISAKSEN, Legal Department, Norwegian
Directorate for Civil Protection (DSB)
ETTU PRIEU, Vice President, Cloud
Initiatives, Elisa
RYAN BURCHNELL, Director, Market
Strategy and Development,
AT&T-FirstNet
RICHARD HARRAP, Managing Director,
Emergency Services Network, EE

15:30-16:00
LEONARDO SPONSORED SESSION
PROFESSIONAL ECOSYSTEM FOR SMART
INDUSTRY
ANGELO BENVENUTO, Head of Solution
and Product Marketing, Leonardo
Cyber Security Division

16:00-16:30
THE IMPACT OF LTE TOWARDS SAFE CITY
IN ABU DHABI
DR.LI.COL. HAMAD KHALIFA AL NUAIMI,
Head of Telecommunications division,
Information Technology Center, Abu
Dhabi Police General Head Quarter

THEATRE C TRANSPORT, UTILITIES AND NON-PPDR

11:00-11:45
PANEL DISCUSSION:
IMPACT OF DECARBONISATION ON THE
MISSION CRITICAL COMMUNICATIONS
NEEDS OF NON-PPDR SECTORS
NICK SMYR, SCADA Working Group,
TCCA
ROBIN DAVIS, Chair, Future
Technologies Group, TCCA
KHOUSTUV GHOSHAL, Vice President &
Head of Utilities, Ericsson
JULIAN STAFFORD, Technical Director,
European Utility Telecom Council
STUART PALMER, CEO of Radlink
Communications Australia

12:00-12:30
THE EVOLVING NEEDS OF THE UTILITY
SECTOR
ADRIAN GRILLI, Technical Manager,
European Utilities Telecoms Council,
EUTC

12:45-13:30
FOCUS ON RAILWAYS
THE FUTURE OF RAILWAY
COMMUNICATIONS
ROBIN DAVIS, Chair, Future
Technologies Group, TCCA
SONIA MIGUEL, Product Manager,
Teltronic
VALERIO DI CLAUDIO, Cyber Security
CTO, Leonardo
PETEVIKKO LYLVI, Expert, mobile
networks, Finnish Transport Network
Agency

13:45-14:15
PRIVATE LTE 450 MHz FOR OIL & GAS
REMOTE WELLS
ABDULLAH ALANAZI, IT Project
Manager, Aramco
KUMEEL ALSMAILI, Energy Segment
Lead, Nokia

14:30-15:00
AXION ENERGY: DEPLOYING A TETRA
SOLUTION FOR A HIGH-RISK OPERATION
GASTÓN GUSTAVO HUGHES JENKINS,
Manager and Founder, OMT SRL

15:00-15:30
NEW SINGAPORE METRO LINES:
ENHANCED CYBER SECURITY SERVICES,
ENCRYPTION AND INTEGRATION WITH
TETRA FOR THE TRANSPORTATION
MARKET
SILVIA FANIGLIULO, International Sales
Manager, Leonardo

15:45-16:15
CCF SPONSORED SESSION: NEXT
GENERATION GEAR FOR FIELD
OPERATIONS: GIMMICK OR REAL
SPEAKER TO BE CONFIRMED

16:15-16:45
TETRA UPDATES FROM THE USA
KEITH AMMONS, Director, North
America TETRA Association & VP
Market Development, PowerTrunk Inc

17:00-17:30
DEPLOYING A FUTURE-READY TETRA
SOLUTION FOR ZÜRICH AIRPORT TO
COVER ALL AIRPORT OPERATIONS
JENS-PETER NEUMANN, Senior Project
Manager, ErvoComm

THEATRE D PUBLIC SAFETY AND CONTROL ROOMS

11:00-11:30
TEST EQUIPMENT AND THE MISSION
CRITICAL SERVICES ECOSYSTEM
FIDEL LIBERAL, Coordinator, MCS
TaaSting & Professor, University of the
Basque Country
DERECK ÖRR, Division Chief, NIST Public
Safety Communications Research
Division

11:45-12:30
NIST SUPPORT OF NEXT GEN
COMMUNICATIONS TECHNOLOGY
DEVELOPED WITH PUBLIC SAFETY
SARAH HUGHES, Prize Challenge
Specialist, NIST Public Safety
Communications Research Division
PATRICK HAGAN, Emergency Operations
Technical Specialist, Houston Fire
Department

12:45-13:15
EVOLVING PUBLIC SAFETY NEEDS
WITHIN THE UNITED STATES
RYAN POLTERMANN, Wireless
Communications Research Engineer,
Pacific Northwest National Laboratory

13:15-13:45
CCF SPONSORED SESSION:
OPTIMISED ALARMING - SAVING LIVES
BY SAVING SECONDS
SIMO RUOKO, CEO & Partner,
Riger-GPS

14:00-14:30
BROADWAY AND BROADGNSS:
REALISING PAN-EUROPEAN
OPERATIONAL MOBILITY FOR PUBLIC
SAFETY RESPONDERS
DAVID LUND, Coordinator of Broadway/
GNSS, Public Safety Communication
Europe (PSCE)

14:45-15:15
ROBUST, RESILIENT AND REDUNDANT
BACKHAUL NETWORKS FOR PSAPS, CIVIL
COMMAND AND CONTROL
DR HERMANN BÜHLER, Vienna
University of Technology & Managing
and Engineering Consultant, Austria

16:00-16:30
A REVIEW OF THE STATE-OF-THE-ART
IN FIRE AND RESCUE COMMAND AND
CONTROL
KEN REHBEHN, Principal Analyst,
CritComm Insights

16:30-17:30
PANEL DISCUSSION:
THE FUTURE OF CONTROL ROOMS
Chair: PAUL BREMMER, Principal
Analyst, Public Safety and Critical
Communications, Omdia
TERRY BURNWORTH, President, Pyramid
Architecture/Engineering & Pyramid
Consulting
DAVID JACKSON, Director of Business
Engagement, Police Digital Service
SALLA LEVONEN, Emergency Response
Control Centre
ROB CLARK, Senior Director, Public
Safety, NextNav



CONFERENCE TIMETABLE

23RD JUNE 2022

THEATRE A INTERNATIONAL PERSPECTIVES AND COLLABORATION

09:30-09:45

WELCOME TO DAY THREE

TERO PESONEN, Board Member and Director, TCCA
+ Introduction to plans for CCW 2023
KATARINA SALMISALO, Communications Director, Erillisverkot

09:45-10:15

KEYNOTE ADDRESS: CRITICAL INFRASTRUCTURE CYBER SECURITY: WHAT TO EXPECT?

URMAS RUUTO, Chief of Technology Branch, NATO Cooperative Cyber Defense Centre of Excellence (CCDCOE)

10:15-11:00

PANEL DISCUSSION WHAT CAN WE DO TO BEST PROTECT OURSELVES FROM CYBERSECURITY THREATS?

Chair: **TERO PESONEN**, Board Member and Director, TCCA
URMAS RUUTO, Chief of Technology Branch, NATO Cooperative Cyber Defense Centre of Excellence (CCDCOE)
DAVID FIRTH, National Cyber Security Centre, NCSC

11:15-11:45

TWO CONCEPTS – ONE MISSION: ERILLISVERKOT & NEDAA MISSION CRITICAL BROADBAND COMMONALITIES AND DIFFERENCES BASED ON EXPERIENCES

ARI TOIVONEN, Programme Director, Erillisverkot

12:00-14:00

GAGV: CRITICAL COMMUNICATIONS DEVELOPMENTS FROM AROUND THE WORLD

Chair: **KEN REHBEHN**, Principal Analyst, CritComms Insights
KYLIE DE COURTENAY, Managing Director, New South Wales Telco Authority (NSWTA), Australia
LUZ FERNANDEZ DEL ROSAL, International Cooperation, Directorate Strategy and Central Management, Federal Agency for Public Safety Digital Radio (BDBOS), Germany
DIMITRI GLISSEN, Program Director, NOOVA, Ministry of Security and Justice, Netherlands
ENG. SAAD IBRAHIM ALASKAR, Director of Field Operations Center, CITC, Saudi Arabia
ELINE PAXAL, Head, Department of Emergency Communications, The Norwegian Directorate for Civil Protection (DSB), Norway
JANE STOJANOV, Head of Sector for Telecommunications in Public Safety, Ministry of Interior, North Macedonia
JOSE ISIDRO TORREBLANCA, Operations Chief, Spanish Nationwide Public Safety and Disaster Relief Network (SIRDEE), Ministry of Interior, Spain

THEATRE B NON TERRESTRIAL NETWORKS

10:00-10:30

COMBINING 5G AND SATELLITE COMMUNICATION FOR DISASTER & RECOVERY OPERATIONS – ESA RESCUE STUDY

HERBERT MITTERMAYER, Partner, Nokia Bellis Lab Consulting Service

10:45-11:45

NON TERRESTRIAL NETWORKS FOR CRITICAL COMMUNICATIONS

Chair: **MARK BALLEEY**, Chair, Broadband Industry Group, TCCA
ALI HELENUS, Head of Strategic Marketing and Technology, Airbus
GIAMPAOLO PANARIELLO, Chief Technology Officer, Nokia
RENAUD MELLIES, Head of International Cooperation, Standardisation and Innovation, RRF Programme, French Ministry of Interior

12:00-13:30

NON TERRESTRIAL NETWORKS: INTEGRATING NTNS WITH TERRESTRIAL NETWORKS

Chair: **BARBARA HELD**, Journalist, Behoerden Spiegel
MAIK BERNICKE, Business Development Manager, Gesat
JENS SPEICHT, Business Development, Global Government, Inmarsat
DYLAN BROWNE, President, Government Business Unit, OneWeb
KIERAN ARNOLD, Chief Architect Future Communication Systems, Satellite Applications, Catapult
MARKO HÖVHTYÄ, New Space Co-Creation Manager and Associate Professor, VTT Technical Research Centre of Finland Ltd
ANTTI KAUPPINEN, Chief Technology Officer, Suomen Erillisverkot

THEATRE C TETRA APPS AND DEVICES

10:15-11:00

PANEL DISCUSSION TETRA APPS

Chair: **HANNU ARONSSON**, Chair, Applications Working Group, TCCA
PETER HUDSON, Chief Technology Officer, Sepura
NIKLAS LAGERBLUM, Product Business Manager, Airbus

11:15-12:00

OXFORD DEBATE: IS VOICE THE KILLER APP OR HAVE APPS KILLED THE VOICE?

Moderator: **MLADEN VRATONJIC**, Board Chair & Director, TCCA
App: **ROBIN DAVIS**, Chair, Future Technologies Group, TCCA & **TERO PESONEN**, Board Member & Director, TCCA
Voice: **PETER PRATER**, Managing Director, Hexagon & **JAIN IVOBY**, Co-Chair, Future Technologies Group, TCCA

12:15-12:45

CCF SPONSORED SESSION SECURITY UP TO APPLICATIONS AND BEYOND

HEIKKI RUPPA, Chair, Signet Digital

THEATRE D CYBERSECURITY

10:45-11:45

UPDATES FROM SFPG: SECURITY MEASURES IN CRITICAL COMMUNICATIONS

Chair: **TREVOR EVANS**, Chair, SFPG, TCCA
DAVID FIRTH, Crypt Security Consultant, National Cyber Security Centre, NCSC
DAVID CHATER LEA, Fellow of the Technical Staff, Motorola Solutions
MIKA LAITINEN, Security and Cryptography Architect, Airbus
BRIAN MUGATROYD, Chair, ETSI TC TCCE

12:00-12:30

MOTOROLA SPONSORED SESSION HOW TO IMPROVE SECURITY IN THE DIGITAL WORLD AGAINST CYBER THREATS

SARA LASSO DE LA VEGA, Cybersecurity Sales Manager for Southern Europe, DACH, Nordics and Baltic regions
MARCUS WALE, Senior Account Manager - Cybersecurity, Motorola Solutions

12:30-13:00

FIRESIDE CHAT: SECURITY CHALLENGES WITH 5G

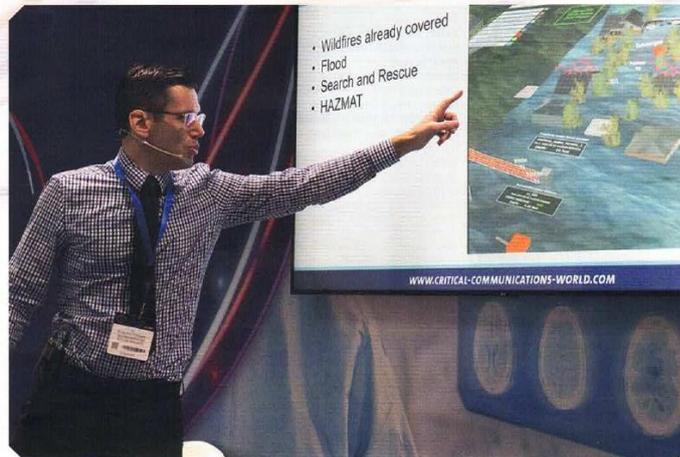
Chair: **ALEXSANDER GORKOWIENKO**, Senior Managing Consultant, Spirent
LAURA KANKAALA, Senior Security Consultant, WithSecure
NILS AHRlich, Head of Security Consulting Practice, Nokia

13:00-13:30

SECURE SMARTPHONE WITH THE COMPLEMENTING ECOSYSTEM, AND INTEROPERABILITY WITH OTHER SYSTEMS IN CRISES ESCALATION

ANDERS BERGHALL, Sales Director, Nordics, Bittium

SCAN HERE TO REGISTER



二、焦點論壇議程

FOCUS FORUM AGENDAS 21ST-23RD JUNE 2022

Focus Forums are in-depth, deep-dive courses which will provide knowledge-sharing and comprehensive updates in each topic area. The focused sessions will comprise of multiple presentations, interactive discussions and roundtables, allowing specialists to come together to learn about developments, and to share their own challenges, experiences and skills. We recommend that participants should have some knowledge in each area, and are keen to actively contribute to the discussions.

REGISTRATION COSTS 145 EUR PER FOCUS FORUM, OR 175 EUR FOR MORE THAN ONE FOCUS FORUM. SPACES ARE LIMITED, SO MAKE SURE YOU REGISTER EARLY TO GUARANTEE YOUR PLACE.

DAY 1 - 21 JUNE

13:30-15:00

ROOM 1: INTERNATIONAL COLLABORATION FOCUS FORUM

Chair: **TERO PESONEN**, Chair, Critical Communications Broadband Group, TCCA

Nationwide developments or updates of their critical communications systems are at different stages around the world. However, it is imperative that challenges, obstacles and successes are shared across international borders, so that national authorities and operators can learn from each other.

This international cooperation will benefit organisations and citizens in each country and will help drive critical communications forward.

- Introduction and setting the scene
- Evolving value chain
- Challenges to be overcome only by cooperation

Speakers: **TERO PESONEN**, TCCA; **PETTERI VIITANEN**, Ericsson; **JARMO VINKUVIST**, Erillisverkot; **ETU PRIEUR**, Elisa; **DR LT COL HAMAD KHALIFA AL NUAIMI**, Abu Dhabi Police; **KEN REHBEHN**, CritComms Insight; **KEVIN GRAHAM**, TCCA; **RICHARD HARRAP**, EE; **HERMAN VAN SPRAKELAAR**, Dutch National Police

15:15-17:30

TETRA: A TECHNOLOGY IN CONTINUOUS EVOLUTION FOCUS FORUM

Chair: **FRANCESCO PASQUALI**, Chair, TETRA Industry Group, TCCA

This session will focus on how TETRA technology is evolving to address the new challenges and demands posed by end users and the market in general.

The forum will represent a unique opportunity for all delegates wishing to understand why TETRA systems remain the optimal, unrivalled and future-proof choice for the critical communications needs of their organisations.

- Welcome and introduction
- TETRA and broadband
- TETRA and cybersecurity
- Panel Discussion: Future challenges with TETRA on broadband and cybersecurity
- TETRA improvements and optimisation
- TETRA data applications
- Panel Discussion: Latest improvements, optimisations and data application solutions

Speakers: **FRANCESCO PASQUALI**, Chair, TETRA Industry Group, TCCA; **TAPIO SAVUNEN**, Airbus; **ARI TOIVONEN**, Erillisverkot; **TIM CLARK**, Motorola Solutions; **PHIL WOODLEY**, Sepura; **HAUKE HOLM**, DAMM Cellular Systems; **HANNU ARONSSON**, Chair, TETRA Applications Working Group, TCCA; **PETER HUDSON**, Sepura

DAY 2 - 22 JUNE

12:30-14:00

ROOM 1: INTERWORKING FOCUS FORUM

Chair: **HARALD LUDWIG**, Chair, Technical Forum, TCCA

This in-depth session will discuss the technical, organisational and operational challenges with connecting networks, with a focus on interworking with the currently used network.

Attendees will learn and exchange their views about the current status of the various standardisation activities to connect 3GPP and non-3GPP systems and how these standards will be put into reality across the mission critical broadband ecosystem.

- Welcome and introduction
- Setting the scene: What is interworking and why is it important?
- Interactive Discussion: What is needed and when is it needed?
- Identification of interworking solutions

Speakers: **HARALD LUDWIG**, Chair, Technical Forum, TCCA; **BERT BOUWERS**, Rohill; **CHARLOTTE ROESENER**, Frequentis; **STEVEN WYCKAERT**, ASTRID

13:30-17:30

ROOM 2: MISSION CRITICAL BROADBAND FOCUS FORUM

Chair: **MARC BALLIET**, Chair, Broadband Industry Group, TCCA

This in-depth focus forum will address the challenges and possible solutions for moving to mission critical broadband.

It will enable participants to learn and exchange their own experiences and ideas.

- Introduction to mission critical broadband
- Mission critical applications
- 5G for mission critical
- Devices for mission critical broadband

Speakers: **MARC BALLIET**, TCCA; **TERO PESONEN**, TCCA; **SHEN MINJUN**, Huawei; **NOEL KIRKALDY**, Nokia; **JASON JOHUR**, Ericsson; **SANDOR SIPOS**, Airbus; **TIM CLARK**, Motorola Solutions; **STEVEN WYCKAERT**, ASTRID; **FILIPPO GAGGIOLI**, Nokia; **SANNE STIIVE**, Ericsson; **PETER HUDSON**, Sepura; **TOPIAS UOTILA**, Goodmill Systems

DAY 3 - 23 JUNE

12:30-14:00

ROOM 1: FUTURE TECHNOLOGIES FOCUS FORUM

Chair: **ROBIN DAVIS**, Chair, Future Technologies Industry Group, TCCA

This Focus Forum course will include presentations from members of the TCCA Future Technologies Group and will cover the up and coming developments in adjacent technologies that are likely to have relevance or impact on critical communications.

This includes technologies that are connected to and relevant with mission critical users and that may utilise mission critical communications as a bearer.

Join this session to learn as well as to exchange your own experiences and views on the technology that will be important in driving the future of critical communications.

- Introduction to the Futures Group
- Future tech horizon scanning
- Panel Discussion

Speakers: **ROBIN DAVIS**, TCCA; **AIN IVORY**, Heritage Comms; **ARI TOIVONEN**, Erillisverkot; **RICARDO GONZALEZ**, Motorola Solutions; **MLADEN VRATONJIC**, TCCA



三、參展廠商位置

FLOOR PLAN

EXHIBITOR NAME	Stand	EXHIBITOR NAME	Stand
Airbus Defence and Space Oy	A120	NEMERGENT	J68
Airbus Defence and Space Oy	A90	NetTechnologies	A89
Aldena Telecomunicazioni SRL	C50	Nokia	C90
Anktion	H102	Nokia	A89
ATDI	G95	Northcom	B50
Athonet	E71	NSTON	A89
ATOS	E70	PanoramaAntennas Ltd	F89
AVISEQ	B50	Patria	A89
Beaconsim	A89	PBE Axell	F69
BHE Bonn Hungary Ltd	F61	PCTEL Inc	D58
Bittium	A89	pei tel Communications GmbH	F60
BXO Solutions	B50	Peter Jones (ILG) Ltd	D60
Capgemini Engineering	G68	Police of Finland	A89
CCS Critical Communications Sweden	B50	Portalify	A89
Codea	A89	PRESCOM	D68
Creanord	A89	Radio Frequency Systems GmbH	G60
Critical Communications Finland	A89	Ranplan Wireless Network Design Ltd	G71
CROSSCALL	G69	Roger-GPS	A89
DAC System Sa	F40	RugGear	D69
DAMM Cellular Systems A/S	F110	SAVOX	A91
DragonForce	C58	SCAN Antenna A/S	C51
Druid Software	C61	Secapp	A89
Emergency Response Centre Agency, Finland	A89	SEE CRITICAL COMMS	G80
Ericsson	F99	See Telecom	E79
Ericsson	A89	Sepura	E102
Erillisverkot Group	A89	Signalstyrkan AB	B50
ETELM	D49	Signet Digital	A89
Etherstack plc	B58	SIMOCO WIRELESS SOLUTIONS	B51
Eurofunk KAPPACHER GmbH	F51	SMARTVISER	G90
Frequentis	G100	Societe Nationale des Autoroutes du Maroc	D100
Genesis	F91	SONIC COMMUNICATIONS (INT) LTD	J60
Handsfree Group	C59	SPINNER GmbH	E58
HUBER+SUHNER AG	D51	SSH	A89
Hytera	D120	SSS Public Safety	G50
Intelsat US, LLC	C83	Stashcat	G120
KAITEC GmbH	F50	Streamwide	C69
Land Mobile/CC Network	C91	Sunit	A89
Leonardo	F120	Swissphone	E41
Lifeline	E90	Tait Communications	D41
LS telcom	C82	Teltronic	E100
Lyfo	G92	THALES	D61
Maven Wireless	B50	Tipro d.o.o	F81
MCS-TaaSting	J45	TPL Systemes	E59
Mentura Group Ltd	A99	Ubiqam	F48
MIC Nordic	B50	Valid8.com, Inc	G91
Motorola Solutions	C120	VIAVI Solutions	E40
Narda Safety Test Solutions GmbH & WILLTRON Technologies GmGH	G99	Zebra	C81
		Zetron	C71





of print. The floorplan is subject to change at the sole discretion of the organisers.

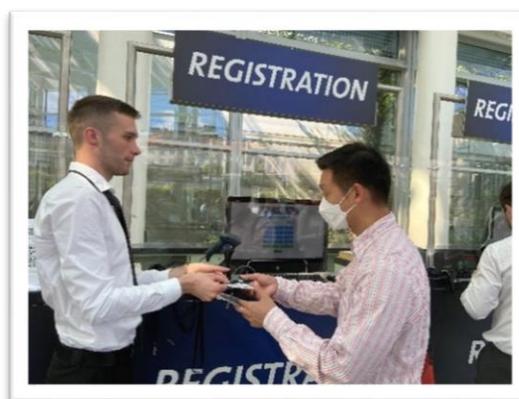
四、入場證



五、會場照片



奧地利維也納MESSE展覽中心



同仁進行報到



同仁於入口處合照



展覽會現場



展覽會現場



TCCA 開幕演講



同仁與參展廠商面對面交流 A



同仁與參展廠商面對面交流 B



同仁與參展廠商面對面交流 C



同仁與參展廠商面對面交流 D



一般發表會主講者現場發表



小組討論會與談人以視訊參與



會場展示之通訊配件



會場展示之天線及纜線